School Shop

FOR INDUSTRIAL ARTS & VOCATIONAL EDUCATION TEACHERS

vol. 1 no. 3
December, 1941

Two Phases of Industrial Education
by Dr. R. O. Small and Dr. Homer J. Smith

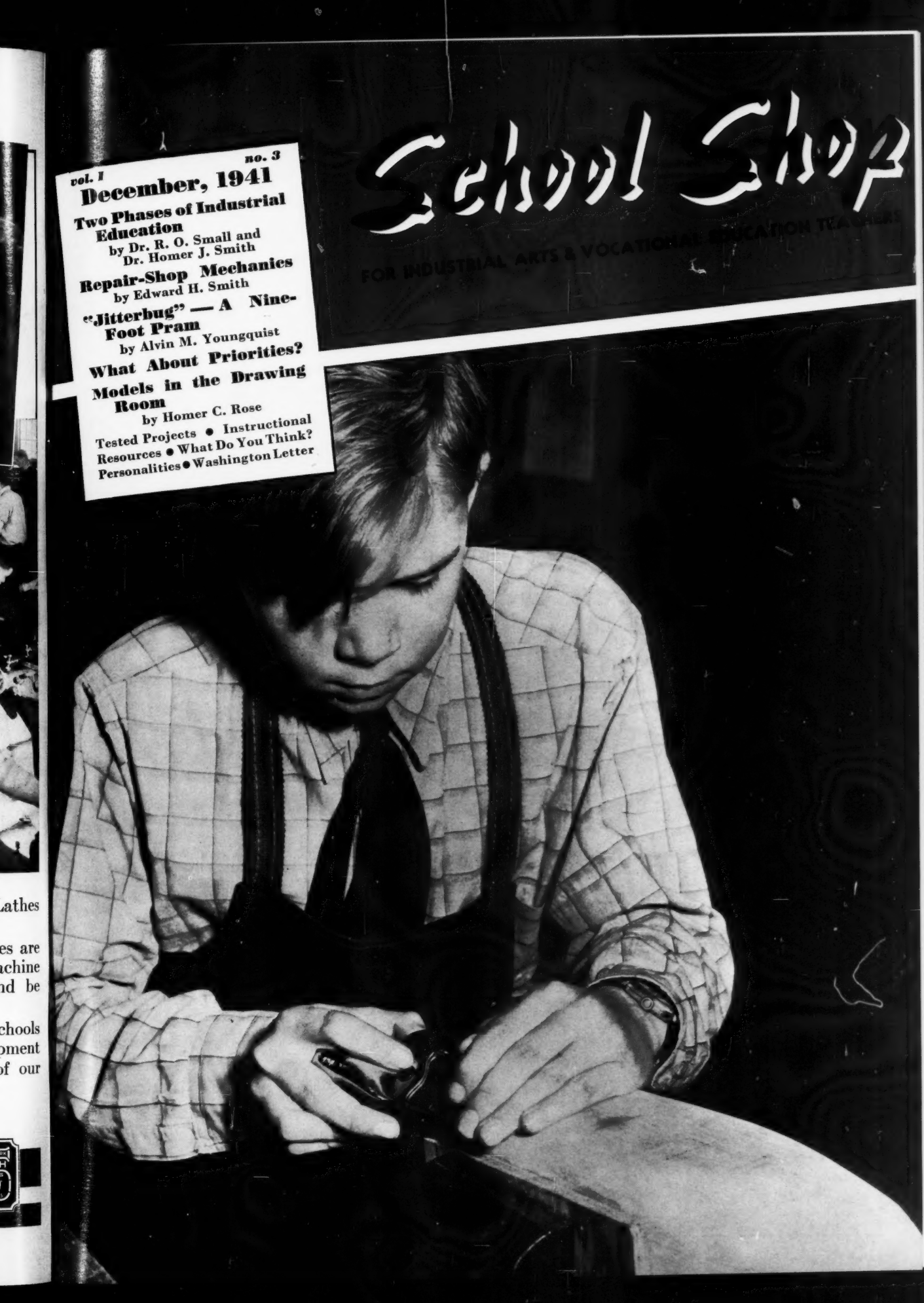
Repair-Shop Mechanics
by Edward H. Smith

"Jitterbug" — A Nine-Foot Pram
by Alvin M. Youngquist

What About Priorities?

Models in the Drawing Room
by Homer C. Rose

Tested Projects • Instructional Resources • What Do You Think? Personalities • Washington Letter



Wanted—Manuscripts

School Shop is seeking short, practical articles on shop subjects. Payment will be made on publication for material used. Articles are wanted in the following subjects:

Woodworking	***Electrical shop***	***Mechanical drawing***
Metalworking	***Handicrafts***	***Auto mechanics***
Machine shop	***Ceramics***	***Aeronautics***
Graphic arts	***Textiles***	***Etc.***

Descriptions of courses of study and curriculum changes are also desired as well as short items of a paragraph or two describing helpful practices in the school shop.

When preparing manuscripts, please keep the following points in mind:

1. The manuscript submitted should not have been published elsewhere.
2. Manuscripts should be typewritten and double spaced.
3. Title of the manuscript should be followed by the name and teaching position of the author, including the name of the school.
4. Illustrations will greatly enhance the value of manuscripts. Provide, if possible, large glossy photographs.
5. Line and working drawings and detail layouts should be as complete as possible, with lettering in black ink.
6. Drawings, illustrations, and photographs should include name of author and self-explanatory titles or legends.
7. Descriptions of projects should include complete list of materials, average time for completion of the project, and a few words on the educational value of the project.

Manuscripts should be addressed as follows:

THE EDITOR

SCHOOL SHOP

P. O. BOX 100, ANN ARBOR, MICHIGAN

An Explanation

of the Circulation Policy of *School Shop*

SCHOOL SHOP is being sent on a complimentary basis to all teachers and supervisors of shop subjects in the United States. The rate to all others, including library and school subscriptions, is $2 a year. Canadian and foreign subscriptions are $3 a year. Special rates apply to group subscriptions to teachers in training. Write for complete details.

This policy has been established by the publishers as a service to shop teachers. Publication of the magazine is made possible by the support of the reputable firms using advertising space in its columns. They deserve your support.

SCHOOL SHOP will be glad to add the names of shop teachers and supervisors who might not be included on the list at present. However, new names must be those of bonafide teachers or supervisors. Names will be added only when the request is made on school stationery and the subject taught is included. Send such requests to

CIRCULATION DEPARTMENT

SCHOOL SHOP

P. O. BOX 100, ANN ARBOR, MICHIGAN

Next Month's Highlights:

1. "England's Defense Training Program."
2. "A Streamlined Approach to Drafting."
3. "Student Control of Shop-Service Responsibilities."
4. Shop-tested Projects.
5. And these regular features: What Do You Think?; Instructional Resources; Washington Letter; Personalities; News from Industry.

Don't Miss Them in Next Month's Issue!

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School Shop

FOR INDUSTRIAL ARTS & VOCATIONAL EDUCATION TEACHERS

CONTENTS

December, 1941
Vol. I, No. 3

Two Phases of Industrial Education 2
Trade and Industrial Education. Dr. R. O. Small
Industrial Arts Education. Dr. Homer J. Smith
Two distinguished leaders define their respective divisions of industrial education.

Repair-Shop Mechanics. Edward H. Smith 3
Oakland's general shop in a trade school; used to develop skills and test aptitudes.

Project of the Month: "Jitterbug"—A Nine-Foot Pram. Alvin M. Youngquist ... 5
A timely and shop-tested woodworking project utilizing plywood.

What About Priorities? 8
Latest information on the new rulings as they apply to school shops.

TESTED INSTRUCTIONAL PROJECTS—
These projects have all been tested in school situations and found useful in shop teaching.

A Modern End Table. Asa A. Robley 9

Electric Hot-Wire "Jigsaw." Byron M. Taylor 10

An Adjustable V-Block. H. R. Trelease 11

Printing Plates from Chalk-Plate Engravings. Adolph J. Schabel 12

Prize-Winning Fruit Bowl Design. A. W. Lamp, Jr. 14

American Vocational Association Convention Program 15

Instructional Resources: Books, Pamphlets, Visual Aids 18
Listings in easy form for clipping and filing.

In the Morning Mail 19
Comments from readers.

Models in the Drawing Room. Homer C. Rose 20
How one teacher arouses interest in architectural drawing.

What Do You Think?—Are you using the unit or general-shop type of organization and why? 21
Supervisors and teachers present their views.

Personalities 22

Washington Letter 24
News from the Nation's Capital of particular interest to shop teachers.

News 24
Items concerning the school shop world.

Index to Advertisers 24

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TWO PHASES OF *Industrial Education*

EDITOR'S NOTE: These two statements are presented to SCHOOL SHOP readers because the editors feel that clarification of the objectives of the great field of industrial education by recognized and respected authorities is needed. These two viewpoints are given, not as sides in a debate, but as an exposition of the job to be done in each field. Dr. Small is immediate past president of the American Vocational Association and has a long and distinguished record of service to his profession. Dr. Smith is vice-president of the A.V.A. representing Industrial Arts Education and has made many noteworthy contributions to his field through writing and teaching.

TRADE AND INDUSTRIAL EDUCATION

Dr. R. O. Small, Director, Division of Vocational Education, Department of Education, Commonwealth of Massachusetts, Boston

UNDER any economic conditions, vocational education should be thought of as an integral part of the whole educational program and not as an entity separate and apart from it. But, wherever organized, it should be distinctive in character, specific in content, dominant in amount, to the end that it may result in training of a quality to command the respect of employers; from its courses, enrollees should go equipped with a skill, an art, or a service which a work-a-day world needs and for which its employers are prepared to pay wages.

This has been our preachment and our practice for the thirty years that state-aided Vocational Education has been established in our Commonwealth. We have stood somewhere and for something. With what results?—We have something to show for our labors. Our clients and those who have benefited through their employment rally to our support. Leaders needing this type of service, in the past only mildly interested, are turning to us for help.

INDUSTRIAL ARTS EDUCATION

Dr. Homer J. Smith, Professor of Industrial Education, University of Minnesota, Minneapolis

THE personal and social values of Industrial Arts courses and activities have become so well established that they need not be reviewed in this brief writing. Except for variety of terms in explanation, there is a heartening measure of agreement as to the contributions that they make to the development of a youth, a school, an adult, and a community. This general phase of industrial education has an economic value, likewise, in the life of a person and a state. It is a worthy partner of modern trade education. Some state and federal aid seem clearly justified.

Industrial Arts instruction helps to keep youth in school and out of the earning market. It is a more dependable selective agent than any test or battery available. It makes specific trade preparation easier and up-grading more convenient. It renders countless youth immediately useful in a host of minor jobs. It builds into millions of future semi-skilled craftsmen and operatives an adaptability that will never cease to serve them. The consumer goods required in the teaching and the wants induced for later satisfaction cannot be ignored. Though often discounted, Industrial Arts Education deserves a premium. It should be more highly regarded by general educators and vocational educators alike.

Repair-Shop Mechanics

Oakland's General Shop in a Trade School Used to Develop Skills and Measure Aptitudes

by Edward H. Smith

THE repair-shop mechanics class at Central Trade School, Oakland, California, is maintained to assist the counselling office in assigning students to vocational training for which they seem best qualified, when the students' background is so limited that more information as to their aptitudes and attitudes is necessary. Or prospective students qualified for certain classes may come to enroll when the class they wish to enter is full. These students can enter the repair shop and take training supplemental to the work done in the class of their choice, to which they will be transferred when there is a vacancy, provided work and attendance have been satisfactory.

The shop contains the equipment found in the average junior and senior high school general wood and metal shop. The training given the student, however, is based on a conception of the part this shop should have in its relation to the purpose of the school—training for industry—which differs very much from the purpose—interest finding—generally thought of in connection with the general shop in the junior and senior high school.

When setting up the course of study to be followed, instructors of the various trade classes were consulted as to jobs the student in the repair shop could be given which would develop skills or habits useful to workmen in their particular fields. All were agreed on one thing: carelessness in thinking, reading, or in actions, has lost many boys a good job.

With facts so gathered as a basis, certain jobs were designated as "required" jobs, involving the use of hand tools and simple machines commonly used in the wood and metal trades. In designing the jobs, much thought went into the creation of situations where carelessness in thinking or working could be easily detected.

Students entering the repair shop are required to do these jobs before doing any work of their own choosing. Each job assignment carries a job card, kept on a rack, the procedure corresponding to the time-card system operated in most shops. The student is responsible for the data entered on the card. Each completed job is graded on four points.

1. Attention paid to work procedure.
2. Industry displayed on the job.
3. Degree of accuracy.
4. Quality or finish.

If the job requires a drawing, the drawing is graded by points lost from a possible 100 grade.

Drawing Schedule	*Points Lost*
Margin line corners crossed	2
Dimensions omitted	1
Dimension arrow points omitted	½
Lettering guide line omitted	1
Invisible outline solid	1
Invisible outline omitted	1
Quality of lettering	1 to 10
Directions not followed	1 to 10

Shop Schedule	*Points Lost*
Job card not made out	5
Date on card omitted	2
Job number not shown	2
Poor work habits	1 to 25
Poor workmanship	1 to 15
Specifications or drawings not followed correctly	10

Principal A. E. Baker of the Central Trade School, Oakland, California, says that the Repair-Shop Mechanics Class is designed to (1) establish in the student certain definite work habits, (2) give an opportunity to develop skill in the use of tools common to the wood and metal trades, with some knowledge of the materials used, (3) furnish means for the student to determine his fitness for a particular trade, and (4) provide an opportunity for the adult past acceptable apprentice age to obtain training for employment as maintenance men. It is in no sense a class for "problem" students, but is essentially a try-out class for post high-school students. Edward H. Smith teaches the course.

The grade earned is entered on the completed job card which is then filed on a hook, visible and easily accessible. The student and any other interested person is thus able to quickly see the progress being made at any time. Recommendation as to change of program, transfer, or elimination, are based on this record of accomplishment.

Each required job is outlined and mounted on a cardboard job sheet, and, since the work is all individual, may be given at any time which best suits the need or convenience of the student.

When all the "required" jobs, as outlined for any shop are completed in a satisfactory manner, the student is ready to enter that shop. If two or more boys are waiting for the same shop when a vacancy occurs, the boy with the best record has first choice.

Following is a sample job. The instructors of welding, electricity, radio, machine shop, body-and-fender, and sheet-metal classes all wanted their students to be able to use and care for a soldering iron. This led to the set-up of "Sheet-Metal jobs No. 2 and 2-A" which are "required" jobs for prospective students for these classes.

Instructors of welding, electricity, radio, body-and-fender, auto-engine repair, sheet-metal, and machine shop classes all wanted their students to be able to sharpen a drill, drill and tap a hole in metal, and have some acquaintance with threads and bolts. This led to set-up of "Machine Job 3," which is "required" for entrance into the classes named.

The list of required jobs is posted on the cabinet holding the job cards, so that entering students may know exactly what is required of them.

Demonstrations are individual, or to small groups, given at the time they are needed.

Repair Shop—Sheet Metal—Job 2A

Follow instructions carefully

Vertical Soldering:

Get an empty gallon can and drill three holes two inches up from the bottom. These holes are ¼" diameter, spaced 1" apart, on centers.

Now drill three holes in the can, 2" down from the top. Space these holes 1½" apart, and ream them out to ¾" diameter. Now cut out, with hand snips, three pieces of bright tin 1¼" diameter.

Next heat the chisel-point iron, and a square-point iron to a dull red in order to burn off all the tinning. File one side, and the point of each iron, and tin the filed side on a block of wood, using soldering paste to make the solder flow.

Next take a clean rag, soak it in clean water and squeeze out all the water you can, leaving the rag damp. This is used to wipe the dross off the iron, instead of cleaning it in the dip-jar. The block of wood is used in place of sal amoniac when tinning the iron, in order to be sure that solder adheres to just one side of the iron. This method of tinning and cleaning the iron is essential for a successful job when soldering vertical seams.

When all the above instructions have been carried out, ask the instructor for a demonstration of the best way to do vertical soldering.

After the demonstration, solder up the holes in the can, keeping the can at all times in a vertical position.

Question Sheet—Machine Job 3

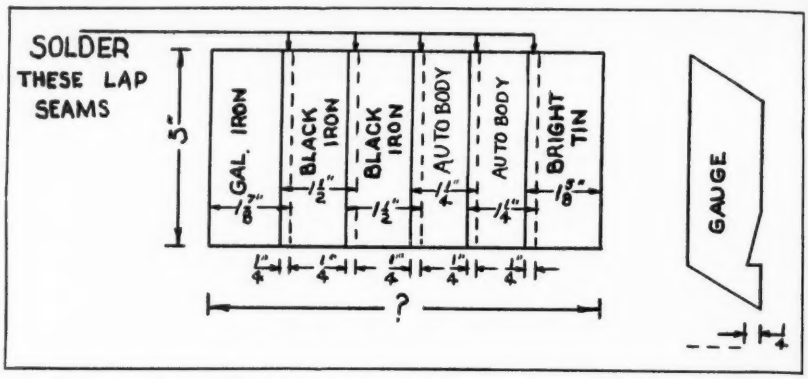
Read Burghardt. Pages 132-138.

1. How are sizes of twist drills designated?
2. How many types of drills are in common use?
3. What is correct clearance angle at the cutting edge?
4. How is the required clearance obtained when grinding a drill?
5. When should the "rake" be ground off a drill?
6. What is indicated when a drill squeaks?
7. What kind of lubricant will be best to use when drilling the "2 x 3" plate?

Read Burghardt. Pages 170-184.

1. Name the two standards used when describing threads of nuts and bolts.
   Notethat these standards have been changed and are now known as National Coarse, N.C., and National Fine, N.F.
2. How many hand taps are in a set?
3. Which one should you use when tapping any of the holes in these plates for Job 3?
4. What is needed to start the tap into the work?
5. How can you keep the tap square?
6. What lubricant will be best for this job?
7. Why is the end of the rod chamfered before the die is started?
8. How do you adjust the die to make a deeper cut when going over it a second time?
9. When cutting a thread what can be done to keep the thread from stripping or tearing?
10. Is the die you are using solid or adjustable?

Repair Shop **Sheet Metal** **Job 2**



Aim: "Sweated" seam soldering on various kinds of metals.

Read over Chapter V, "Soldering" in *Sheet Metal Workers' Manual*, Chicago: Frederick J. Drake & Co. Then turn to the back of the book and read pages 302, 303, 304, 305 in Section 6. Write out the answers to questions 1 to 10 on page 304.

Using scrap material and hand snips, cut the following: one piece of galvanized iron 1⅞" x 5", two pieces of black sheet iron 1½" x 5", two pieces of auto-body steel 1¼" x 5", one piece of bright tin 1⅝" x 5".

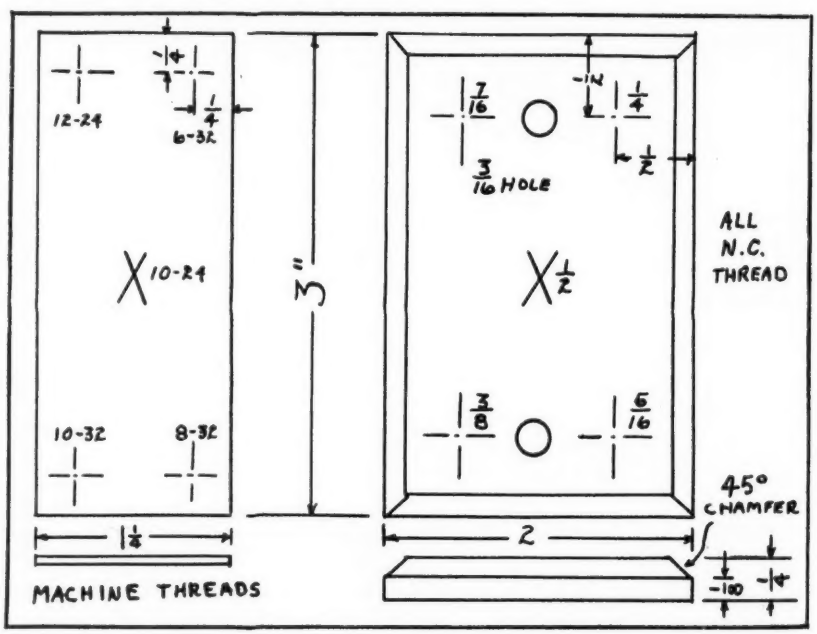
Follow instructions given in Chapter V (Soldering), and forge an iron to a chisel point (1/16" x ¼"), then file the point and four sides, and tin the iron, using the sal-amoniac block.

Next tin both long edges, both sides, of the black-iron and auto-body strips. Now use the metal gauge to mark the lap on all the strips. At this point ask the instructor for a demonstration on the best way to hold the soldering iron when soldering a flat seam, in horizontal position.

Note: Your success with this job depends upon the proper tinning of the metal and the soldering iron.

Repair Shop **Machine Department** **Job 3**

Student's objective: Learn the various kinds of machine threads in use, how to use a twist drill, a tap, and a die.



Materials needed:

A piece of auto body steel.

A piece of mild flat steel, and various round rods.

Refer to the chart for proper size drill to use for taps which will cut the threads specified on the drawing.

Read carefully Burghardt. Pages 170 to 183.

Use emery cloth, or a smooth file, to prepare the surface of the mild steel plate and then lay out the centers of holes to be drilled, as shown using rule and lead pencil. Center the holes carefully with hammer and center punch, and then drill and tap. At this point ask instructor for a demonstration on sharpening a drill and tapping a thread.

If you break a drill, or a tap, go to the instructor and get another, but be careful. The workman who breaks many tools finds it hard to get along in industry.

A seaworthy craft.

Project of the Month:

"Jitterbug"—A Nine-Foot Pram

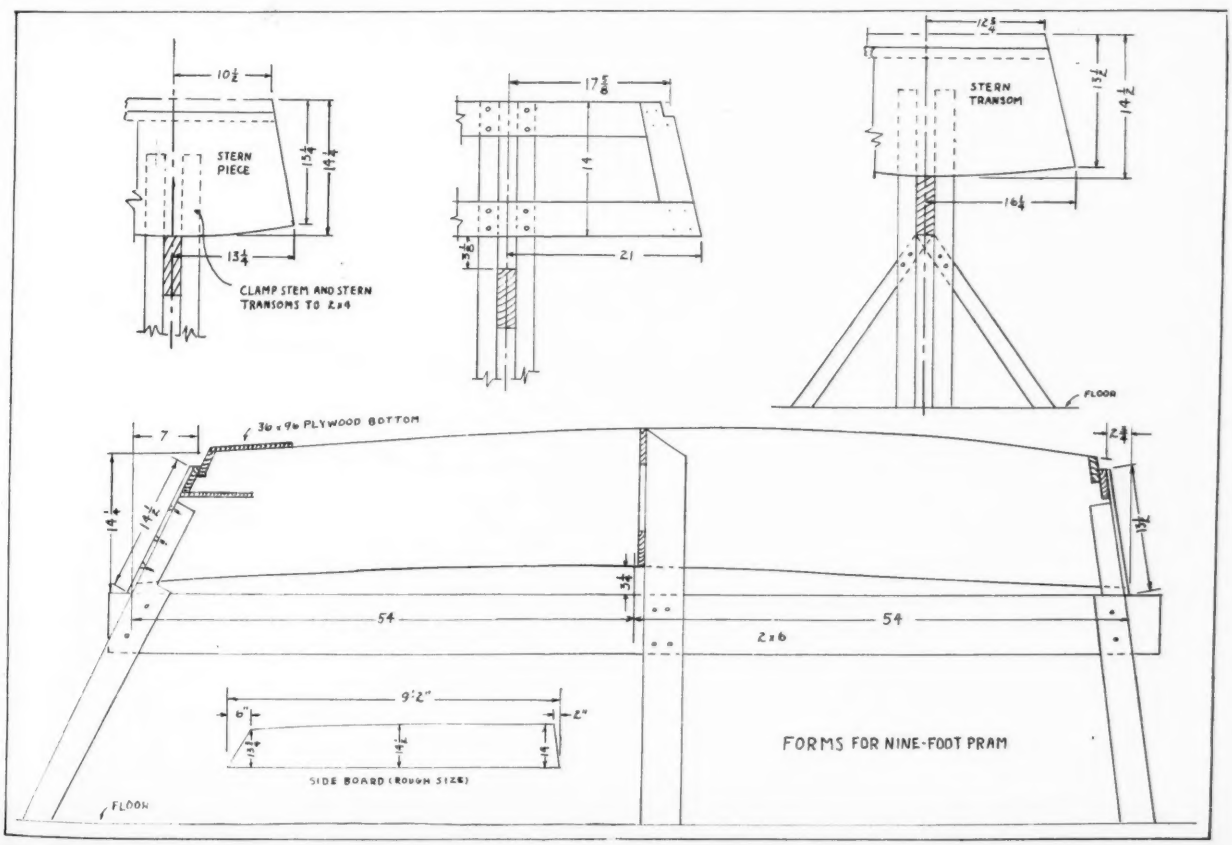
by Alvin M. Youngquist

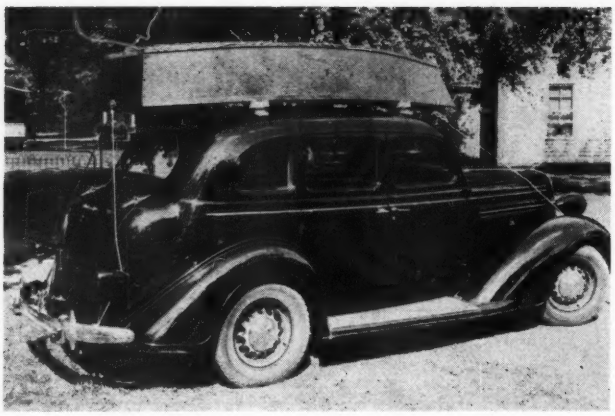
Popularity of the "Jitterbug" is attested by the fact that a dozen of these boats have been built in the shops of Waite High School, Toledo, Ohio. Alvin M. Youngquist, naval architect, teaches at Waite High School.

BUILDING a boat is an interesting and popular school shop project and gives variety to the usual woodworking course. In many school shops, space for building boats is limited. The nine-foot pram illustrated requires a minimum of space. A dozen of these boats were built at Morrison R. Waite High School, Toledo, Ohio.

The *Jitterbug* is an ideal small boat for fishermen, for yacht tenders, or for an all-purpose row boat. It weighs about 80 pounds and is easy to transport on a car top. Special hinged sponge-rubber pads that fit any car top are detailed on the plans. These protective pads are quickly attached and easy to make. The boat is safe, rows very easily, and carries three adults with ease. A lightweight outboard motor may be used very successfully, but in this case the stern transom should be reinforced by a piece of oak or pine ¾" x 8" fitted vertically. The cost of materials is $18.00 to $20.00.

First set up a building trunk consisting of a 2" x 6", or 2" x 8", 10' long with supports to the floor as indicated on the plans. Only one mold amidship is necessary and this can be made of any material available. The fore and aft





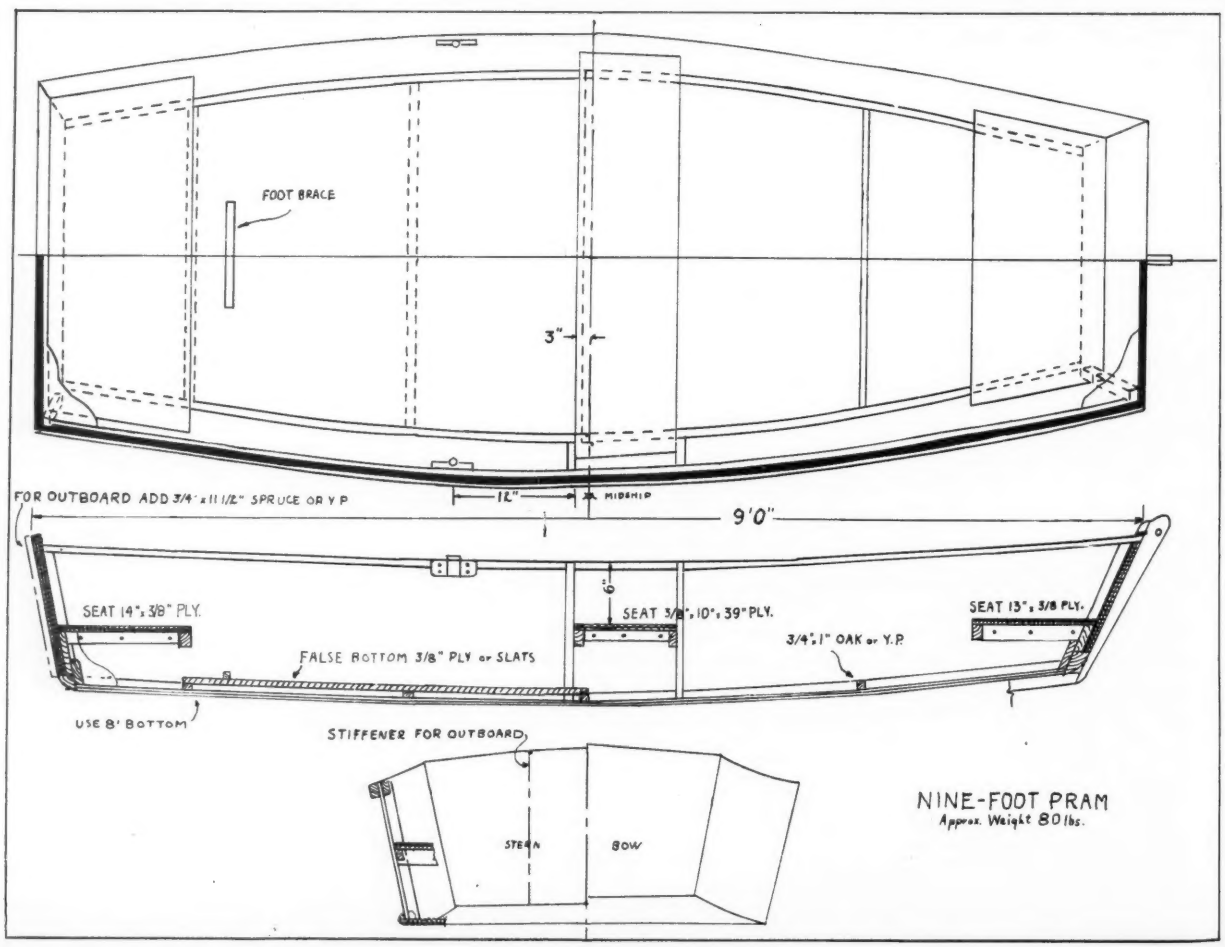
Easily transported on car top.

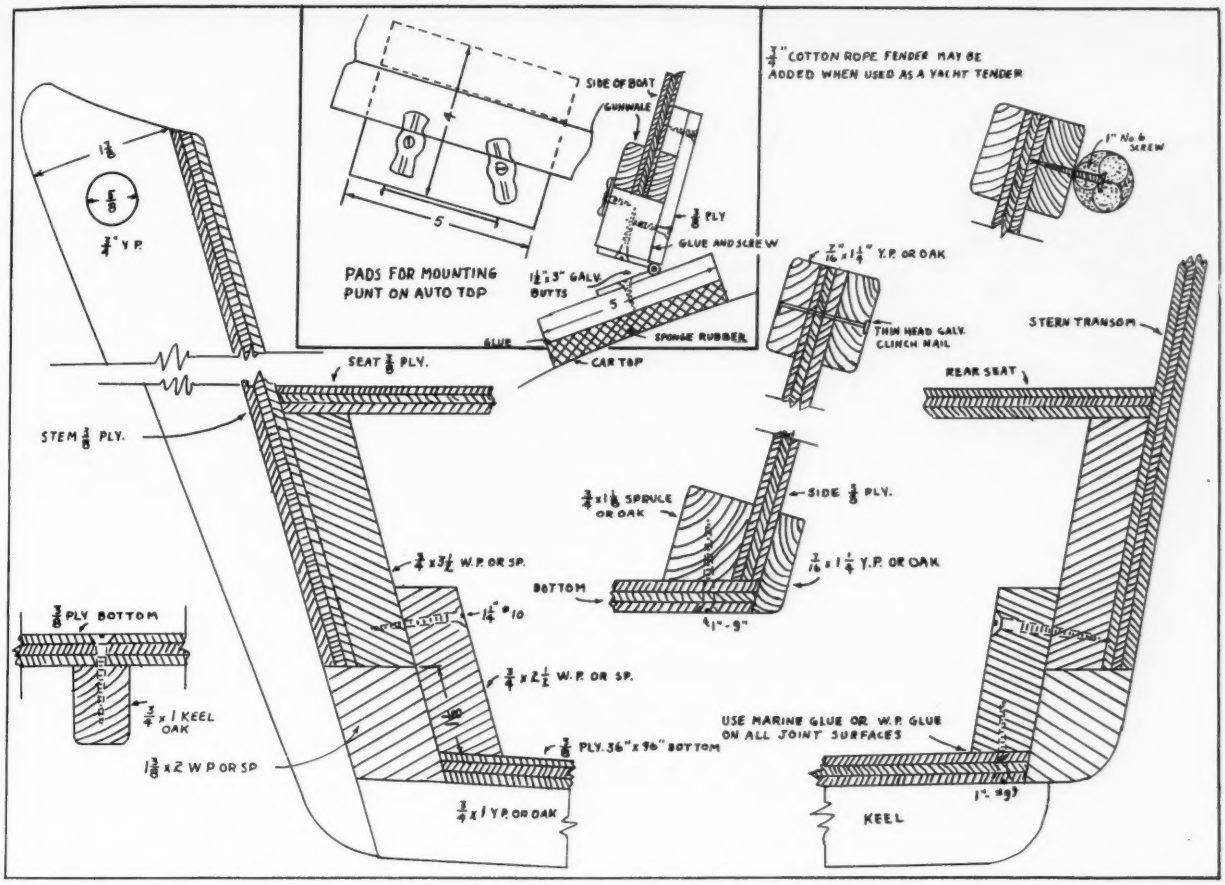
transoms of plywood are next secured with temporary fastening to the trunk at the correct angle. Note the double, offset, reinforcing strips at the bottom of the transoms. For the sides a piece of 3/8" x 30" x 10'-0 waterproof fir plywood is required; for the bottom one piece 3/8" x 36" x 8'-0. Be sure to get hot-pressed, resinous bonded, waterproof plywood. Cut the side pieces to the rough size, bend around the center mold and fasten with 1" No. 8 brass screws to the side cleats on the fore and aft transoms. Use cold resinous waterproof glue on all contact surfaces.

The inner chines of 3/4" x 1 1/8" white oak are bent into place and fastened to the sides with screws and glue. Dress off the chines and sides to the correct angle and to a fair curve fore and aft for the bottom. Lay a straight edge from side to side to test the planing. Careful dressing of the chines is necessary to insure a watertight job. The bottom is then fastened on with screws and glue. Dress off the bottom flush with the sides and fit the 1 3/8" x 2" white pine filler blocks on the fore and aft transoms. These filler strips are rounded off on the outside edge as indicated on the plans. The outside chines, or rub strakes of 7/16" x 1 1/4" oak are then fastened in place, covering the edge of the bottom plywood. On the centerline fit a keel of 3/4" x 1" oak with screws from the inside. The boat is now ready to lift off the mold and turn over. It is advisable to fit a temporary brace amidship to prevent the flare of the sides from springing inward until the center seat is in place.

Fitting of the gunwales, seats, and floor braces is clearly indicated on the plans and therefore no special instructions are needed. It is advisable to fit a removable floor of 3/8" plywood, or of slats, to protect the bottom from foot wear, and this also leaves a little reservoir underneath for any water that may get in the boat.

The boat should be sanded lightly before applying finishes. Screwheads can be covered with commercial plastic compositions. A resinous penetrating primer is recommended for fir plywood. After the primer use a good grade of outside





spar varnish (about three coats), or a good marine paint.

Use galvanized side plate sockets for the rowlocks, and 6- or 6½-foot ash oars are satisfactory.

For carrying the boat on a car top, hinged pads which adjust themselves to the curves of the car can easily be made. Sponge rubber, which cushions the weight and prevents any marring of the car finish, is glued to the pads.

With reasonable care you will have a very satisfactory, watertight boat, which will give years of service and enjoyment.

Bill of Materials:

1 pc. 36" x 96" waterproof ⅜" 5-ply fir plywood (bottom).

42 sq. ft. ⅜" waterproof 5-ply fir plywood (sides, seats, transoms).

2 pcs. ¾" x 1⅛" x 8' 0" oak chine strips.

6 pcs. 7/16" x 1¼" x 10' 0" oak (gunwales, rub strakes).

1 pc. ¾" x 9' 0" oak (keel strip).

1 pc. ¾" x 3½" x 4' 0" white pine (transom reinforcing).

1 pc. ¾" x 2½" x 4' 0" white pine (transom reinforcing).

1 pc. 1⅛" x 2" x 4' 0" white pine (transom filler stock).

Miscellaneous seat supports, cleats, and bracing.

2 gross 1" No. 8 brass wood screws.

1 gross 1¼" No. 10 brass wood screws.

1 lb. cold resinous waterproof glue.

1 qt. resinous primer.

1 qt. marine spar varnish (or paint).

1 pr. No. 0 galvanized rowlocks and side-plate sockets.

1 pr. 6' ash oars.

Printing Education Week—January 12-17, 1942

Schools, colleges, and universities throughout the country are observing Printing Education Week, January 12 to 17, 1942, with appropriate displays, programs, and public events.

The objective of the observance is to bring to the attention of printers, students, parents, and school administrators the contribution of printing education to the general culture and well-being.

The National Graphic Arts Education Association, 412 National Savings and Trust Building, 719 Fifteenth St., N.W., Washington, D. C., has available a variety of free material which can be used in the observance. Included are a two-color poster, two historical plays, gummed stickers, and special blotters. Copies of *Poor Richard's Almanac* may be secured for one cent each with a 25 percent discount for single orders over 1000. This last is published as a Personal Growth Leaflet by the National Education Association, Washington, D. C.

The theme of the observance this year is "Printing Education for Defense." The celebration is timed to coincide with the 236th anniversary of the birth of Benjamin Franklin.

Joseph B. Coyle, Johnstown, Pa., High School, is national chairman of Printing Education Week. He urges widespread observance of the event by schools and departments of printing everywhere.

WHAT ABOUT *Priorities?*

PREFERENCE RATING ORDER P-22, most important priority rating for school shops, has been amended as of October 16, 1941, and retitled *Preference Rating Order P-22 Amended.* This amendment greatly widens the scope of the original order, to the benefit of schools, and it is herewith presented in summary, for clarity and ready reference.

What orders get priority ratings?

1. Machinery (or parts) to repair or replace existing equipment which is broken, out of repair, or worn out.

2. Supplies such as fuel, lubricants, small perishable tools, etc., necessary to the operation of existing equipment.

What orders do not get priority ratings?

1. Machinery or equipment *which can be secured without a priority rating.*

2. Machinery or equipment for addition and expansion of existing shop facilities.*

3. Parts, equipment, or supplies in quantities greater than needed or at dates earlier than needed for maintenance purposes.

4. Scarce materials the use of which can be avoided by substitution or by simplification of design.

5. Repair or maintenance items ordered when reserve stock of such items is *above a practical working minimum.*

6. Repair or maintenance items in excess of *one-fourth of the dollar volume of such items used during the calendar year 1940,* except with permission of the Director of Priorities.

*Equipment for defense training classes can receive priority. See later explanation.

How to apply the preference rating

1. All that is required of the purchaser is that his official purchasing agent endorse the following statement on the original and all copies of the purchase order:

"Material for maintenance, repair, or operating supplies—rating A-10 under Preference Order P-22 Amended, with the terms of which I am familiar."

No supplier of material is authorized to fill the order without the above statement. In addition, *the purchaser must retain endorsed copies of such purchase orders,* separate from other purchase orders or contracts, *for a period of two years from date of order, for inspection by authorized representatives of the Office for Production Management.*

2. For machinery, parts, equipment, or supplies not obtainable under *Order P-22 Amended,* or without priority rating, a request for individual preference rating must be filled out and submitted to the Director of Priorities, Office of Production Management. This application should be made on *Office of Production Management form PD-1.*

3. For machinery, parts, equipment, or supplies needed in expansion or operation of a formal defense-training program, the school should apply to the U.S. Office of Education or to the Director of Vocational Education in his state and priority ratings will be issued.

What does the priority rating mean?

1. Orders under *Order P-22 Amended* are granted priority ratings of A-10, as necessary to national defense. This means that they will receive preference over orders bearing lower ratings, but that orders with higher ratings will have right-of-way both as to filling and delivery date.

2. NOTE: Orders granted the above preference rating are not guaranteed to be filled—filling of the order is contingent on availability of materials needed and on orders with higher priority ratings.

3. *Order P-22 Amended* shall be in effect until April 1, 1942, unless revoked by the Director of Priorities before that date.

Further information

SCHOOL SHOP will be glad to answer, or pass on to the proper authorities, any priorities question or problem which you may be confronted with in your school. All information in this outline has been taken from *Office of Production Management Preference Rating Order P-22 Amended* and *Application for Preference Rating form PD-1,* copies of which may be had from:

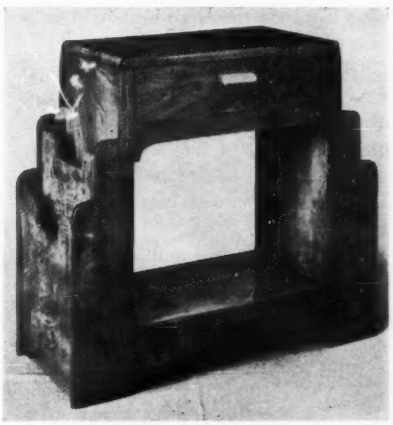
SCHOOL SHOP, Ann Arbor, Michigan, *or* U. S. Office of Education, Washington, D.C., *or* Office of Production Management, Priorities Division, Washington, D.C.

SCHOOL SHOP will also supply on request the name of the manager of the Priorities Field Office in your district.

Tested Instructional Projects

—These projects have all been shop tested for school use

A Modern End Table



by Asa A. Robley

This neat and modern end table is excellent for woodworking or cabinet-making classes. By using solid stock, it is not too difficult for advanced eighth or ninth graders. Veneering would require more skill than junior high-school students usually possess. Asa A. Robley is an Instructor in Industrial Arts at Oregon State College, Corvallis.

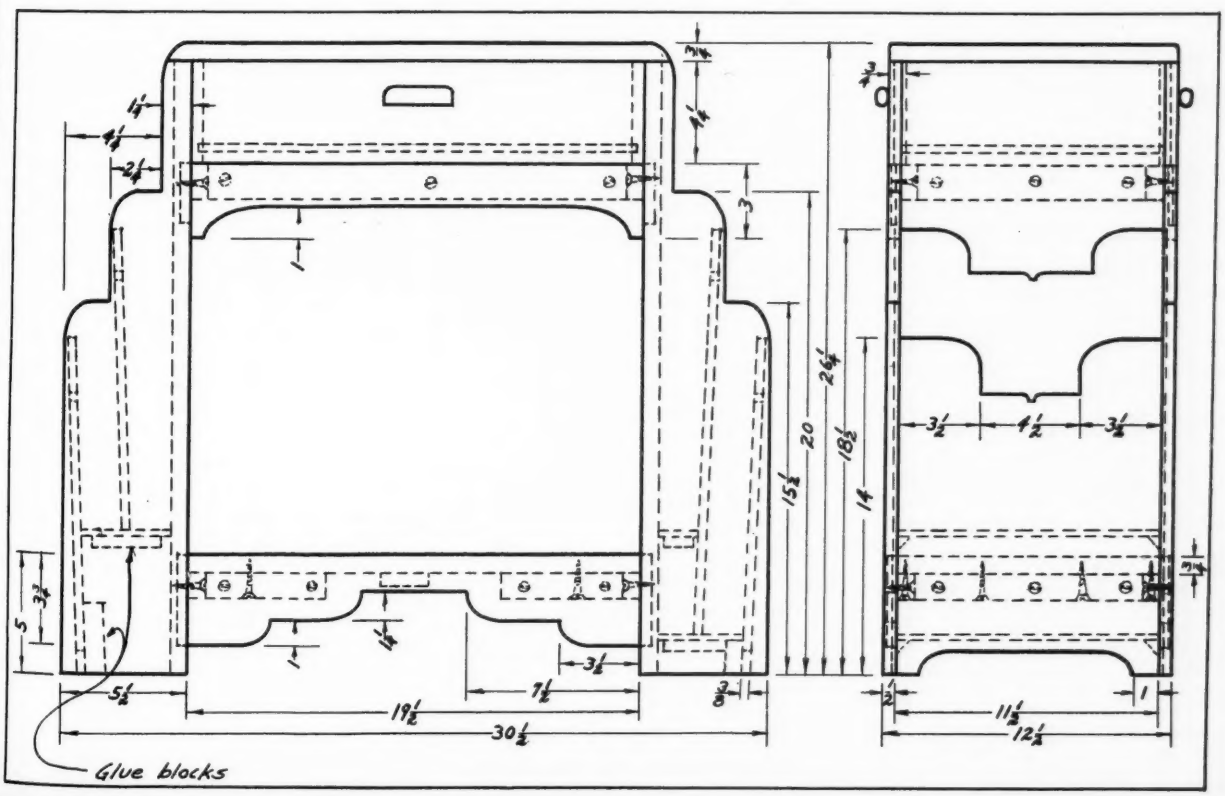
THIS modern end table is suitable for junior or senior high-school classes in woodworking, according to the type of construction used in the table. If solid stock or panel stock is used for all the panels, then the table could be built with the equipment in the usual high-school shop. If, however, part or all of the panels were built up and veneered by the student, some skills and equipment not found in many high schools would be involved.

Figured solid maple was used for the front rails and stiles and for the drawer fronts on the table shown in the accompanying photograph. The ⅜″ panels for the magazine compartments were built up of three plies, bird's-eye maple as the face and back veneers for the shelf and ends. For the face veneer on the top, a four-way match of figured maple was used. A pine core was used for all the panels, with ⅛″ poplar crossbanding being used for the second and fourth plys in the ¾″ panels. Booking strips of maple were used wherever necessary to keep the corestock and crossbanding from showing.

The two handles for the double-acting drawer were made of white plastic rod. They form a pleasing contrast to the golden maple finish of the table. The magazine compartments are made in various depths so that different sizes of magazines may be best accommodated.

Following is an outline of the major steps in the construction of the table. Such operations as getting out stock and veneering have been omitted because they would occupy various positions in the outline according to the type of construction used.

1. Cut mortises, tenons, and grooves on front rails and stiles.
2. Shape rails and stiles, then assemble these into two front units.
3. Cut the ¾ x 11½ x 2—1½ ends to size.
4. Cut the ¾ x 11½ x 1—7½ bottom shelf to size.
5. Assemble the 11½ x 1—7½ frame



which acts as a drawer guide.

6. Assemble the above members, using screws and ¾″ x 1″ hardwood blocks in fastening the front units to the bottom shelf and to the ends. Use screws to fasten the front units and ends to the drawer slide frame.

7. Slide the end panels for the magazine compartments into their grooves and glue-block them into place along with the bottoms of the compartments.

8. Cut the top to size and shape, then fasten into place with flat steel tabletop fasteners.

9. Assemble drawer and fit into place.

10. Apply finish.

Any good cabinet wood can be used successfully for this table with either the solid or veneered type of construction. A material bill for the solid stock type of construction follows:

Name of Part	*No. of Pieces*	*T*	*W*	*L*	*Material*
Front top rails	2	½	3	1′ 8½″	*
Front bottom rails	2	½	3¾	1′ 8½″	*
Front stiles	4	½	5½	2′ 1½″	*
Top	1	¾	12½	1′ 9¾″	*
Shelf	1	¾	12½	1′ 7½″	*
Ends	2	¾	11½	2′ 1½″	*
Compartment panels	2	⅜	11⅞	1′ 2″	†
Compartment panels	1	⅜	11⅞	1′ 5″	†
Compartment panels	1	⅜	11⅞	1′ ½″	†
Compartment bot'ms	1	¼	9	0′11½″	†
Drawer fronts	2	¾	4¼	1′ 7½″	*
Drawer sides	2	½	4¼	1′ 0″	‡
Drawer bottom	1	¼	11½	1′ 7″	†
Drawer slide frame	2	¾	1½	0′11½″	‡
Drawer slide frame	2	¾	1½	1′ 6″	‡

*Whatever cabinet wood that has been selected for the table. The plywood used for the compartment panels should be faced with the same wood as is used for the solid stock.

†Plywood.

‡Hardwood.

● An explosive rivet, now being manufactured in commercial quantities by E. I. du Pont de Nemours & Co., Inc., may prove an important factor in speeding American aircraft production and in simplifying design, according to D. L. Lewis, Jr., writing in *Machinery*. The rivet, of entirely new type, has a high explosive secreted in a cavity at the end of the shank. Heat applied to the rivet head by an electric gun detonates the charge. The resulting explosion expands the charged end of the shank, thus forming a "blind" head and setting the rivet. The explosive charge is controlled so accurately that the expansion it effects may be held within limits of 0.020 inch. The whole operation is thus performed from one side of the work, with greater ease and speed than is possible by any mechanical means now being used in aircraft factories.

An Electric Hot-Wire "Jigsaw"

by B. M. Taylor

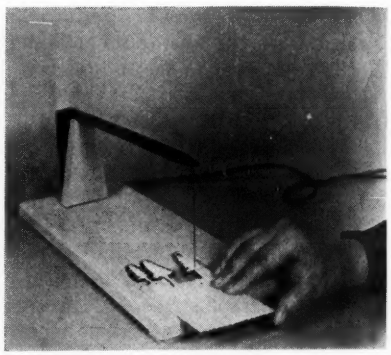
HERE is a device that "cuts" artistic letters, outlines, and contours by means of an electrically heated high-resistance wire or ribbon. It is easy and inexpensive to make and requires only a car battery or a 6-volt transformer (not less than 25 watt) for current.

Begin construction by cutting the wood base ¾″ x 7″ x 15″. Chamfer the top edges, then drill the ¾″ hole as shown in Fig. 1. Mount the ¼″ legs at the corners.

Next cut from ¾″ stock the brace, shown in detail in Fig. 2. Fasten the brace to the base with two No. 6 x 1¼″ R.H. blued wood screws.

The supporting arm is made from a piece of band iron ⅛″ x 1″ x 20″. Bend the iron at right angles 6¾″ from one end. Drill two 9/64″ holes ⅜″ from this same end. Drill another 9/64″ hole 3⅜″ from the bend. Grind the tip of the long end of the arm to the general shape shown in Fig. 3. Hacksaw a slot back ¼″ from the end. File the two notches as shown. Now, mount the supporting arm on the base and the brace with 3 No. 6 x 1″ R.H. wood screws. On one of the screws going into the base, place a No. 8 brass washer. This will be one of the binding posts for the electric wires.

For the anchor, to which the lower end of the ribbon is attached, cut a piece of sheet metal 20 ga. x 2″ x 2″. Bore a 3/16″ hole where shown in Fig. 4. With a cold chisel or jeweler's saw, make a slot from this hole back to the center of the piece. Also near each corner bore and countersink holes for No. 6 flathead screws. Next, hold the anchor in its place on top of the base and mark around it. Second, cut the wood with a chisel so that anchor will rest flush with top of board. Now fasten the anchor with 3 No. 6 x ½″ FH wood screws and 1 No. 6—32 x 1″ FH machine screw with nut and washer. To this machine screw, fasten a piece of No. 18 bare copper wire. Run the wire to the back edge of the base and fasten it with a No. 6 x 1″ RH wood screw with washer. This is the other binding post.

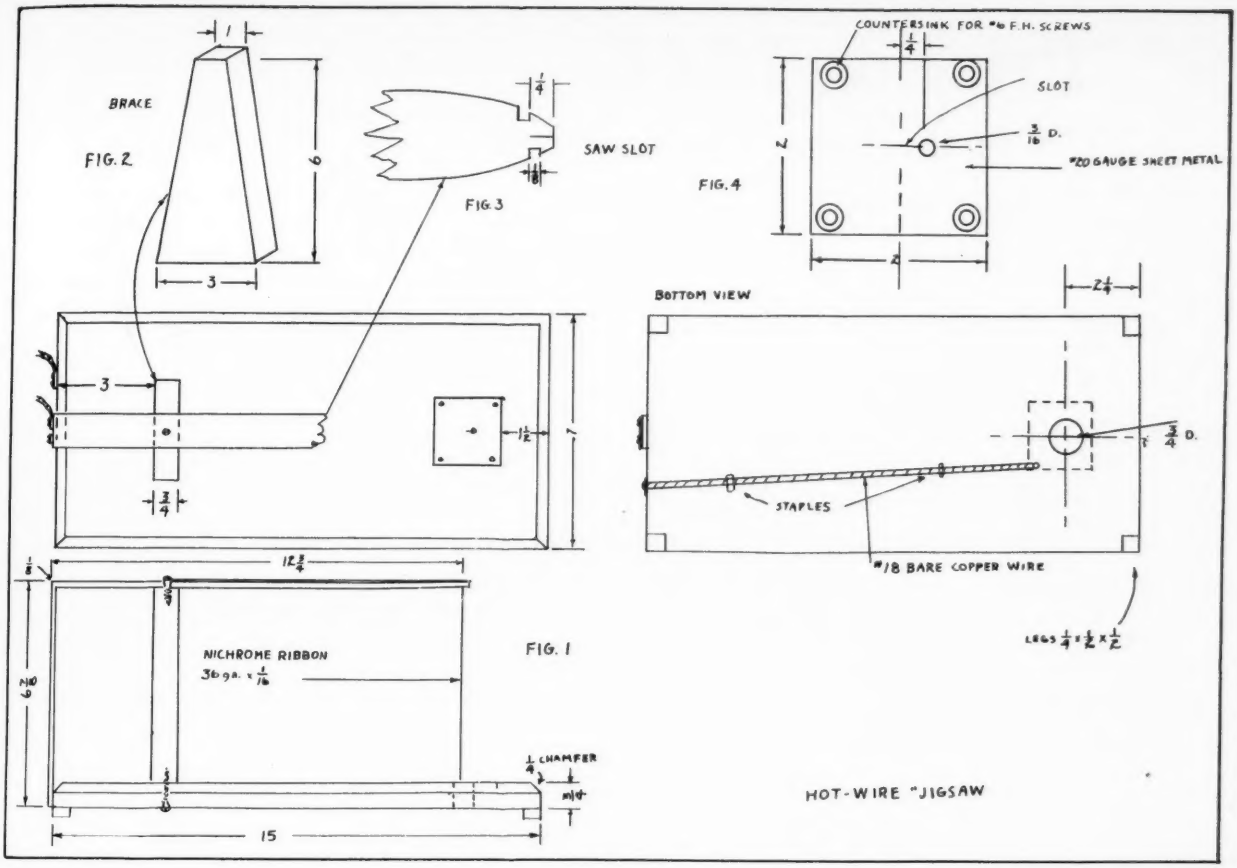


For the "saw" proper, get a piece of 36 gauge x 1/16″ x 7″ nichrome ribbon such as is used in toasters, etc. Near an end of the ribbon tie a knot. Drop the knot through the hole in the anchor and slide the ribbon into the slot. Pull the ribbon up tightly. Next, press supporting arm down about ½″ and run ribbon through its slot and wrap it around arm. Ribbon should be quite tight.

Connect binding posts to the electric source of 6 volts. Ribbon should heat to a bright red. First pencil or stencil design on the wood (basswood or sugar pine about 1/16″ thick works well although it will take thicker wood). For rapid cutting, it will be necessary to move job up and down the ribbon. Lines and shadings needed but not requiring the removal of the wood may be had by using a pyrograph. (See article on page 14, October, 1941, SCHOOL SHOP—*Editor.*) Further effects may be had by coloring. When the design is completed it may be glued to a background of heavier wood and the whole assembly given a coat of shellac or varnish.

This "jigsaw" may be used for silhouettes, scenic dioramas, and for some surprisingly good portraits.

This project goes well with the "Heat Pencil" described by the same author in the November issue of SCHOOL SHOP. B. M. Taylor teaches electricity in the Woodrow Wilson Junior High School, San Diego, California.



An Adjustable V-Block

by H. R. Trelease

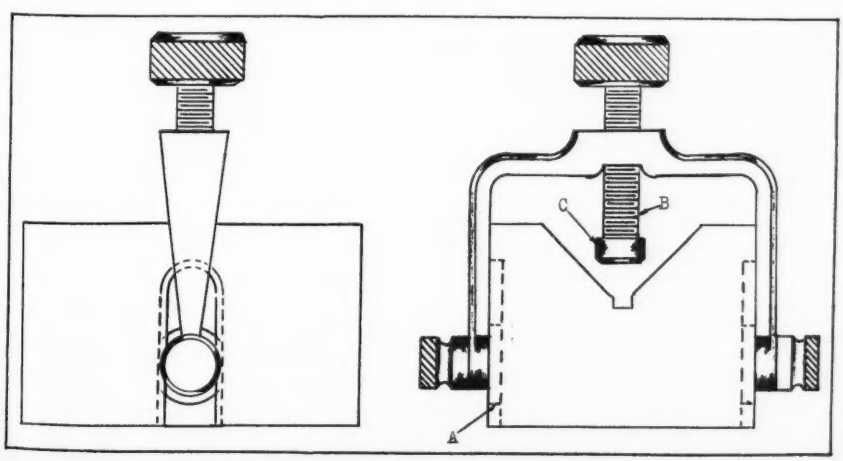
This handy device is particularly valuable for instructional purposes as it involves a wide range of operations; i.e., milling, shaping, knurling, threading, rivetting, and turning. About 30 hours are required to complete the project. The scale of the drawing is approximately two-thirds size. H. R. Trelease is Technical High School Instructor, Essex County Vocational School, Bloomfield, N.J.

THE illustrations show an improved V-Block. The advantages over the usual type, combined with extreme simplicity, are as follows:

Having dovetail slots *A*, quick adjustment can be made when working with large or small diameters without moving the screw *B*.

When the work is set to the required position, a turn of the screw *B* is all that is necessary to hold the work firmly in position, thereby ensuring perfect rigidity. A small brass swivel *C* is fitted to the screw *B*, thus obviating any possible danger of damaging the surface of the work.

The length of the slot *A* and screw *B* combined give equal facilities for clamping, whether the work be large or small, and for so small a tool a large range of sizes can be accommodated.



● Walter E. Englund, Editor of the *Minnesota Journal of Education* states, "Some day we are going to recognize the fact that pupils desiring to fit themselves for the skilled trades need training as much as do those desirous of entering one of the professions. Training courses will be offered on a post high-school level in state-supported institutions conveniently located throughout the state. The cost will be heavy, and we shall find difficulty in financing the undertaking, but that can hardly be a final or valid answer to those who need and deserve the service."

Printing Plates
from Chalk-Plate Engravings
by Adolph J. Schabel

Chalk-plate making should appeal to teachers imbued with a spirit of research and confronted with the problems of illustration common to school art and printing departments. Adolph J. Schabel teaches at Schuyler High School, Albany, N.Y.

ONE picture is worth ten thousand words."

Thus does an old Chinese proverb evaluate the power of a picture in giving information of people, places, and things. A picture speaks in a universal tongue. It is interesting equally to the educated and to the illiterate. It is decorative and attention-compelling.

This method of conveying information was early sought by the publishers of newspapers. To reproduce a picture in the ink and impression method of printing was the problem. Joseph M. Hoke first introduced the chalk-plate method of making printing plates in 1888. Many improvements have since been made in the composition of the chalk-plate coating.

The chalk-plate method is one of the cheapest, quickest, and most satisfactory mediums available today for making printed illustrations for high-school publications, lesson instruction sheets, school printing, etc. The chalk-plate method is often a more servicable and more economical medium than the up-to-date photo-engraving process for making the cartoonettes or comics in school publications. This method provides a means for activity and experimentation on the part of the student. Interest is kept alive because the student is allowed to follow through and complete the entire job.

Chalk plates may be purchased completely prepared from several manufacturers or may be prepared (coated) in school from material and instructions assembled into handy, economical, printing-plate work-kits.

The base plates may be made from sheets of rolled steel (hard saw steel) and cut to convenient working and printing sizes. Tempered masonite, costing 10c a square foot, may also be used as base material. The steel base plates should be about 1/16" thick and perfectly smooth, the masonite plates 1/8" thick. When made of steel they should be perfectly ground on both sides, and blued in heat.

Coating the Base Plate—First of all, prepare the chalk coating for the steel or masonite base plate. An old formula for chalk composition contains:

Egg albumen	120 grains
Water	6 ounces
Ammonia .880	¼ ounce
Glycerin	7 drops
Precipitated chalk	3 ounces
French chalk	1 ounce

Mix the last two ingredients together, dry, in a crock or other earthen vessel. Then add to the albumen mixture, employing a mortar to mix the whole to a thick paste.

It is best to place side angle irons or frame of desired depth (approximately 1/8") on base plate and pour mixture between these. By means of a spatula, spread smoothly, level, and allow to settle for ten minutes. Then bake in moderate heat until thoroughly dried. When properly baked the top will curl up in a sort of filmy crust. This is removed with a flat knife and the coated plate is then reduced by scraping to proper thickness, which is about that of three sheets of manila tagboard.

Transferring the Drawing—The design or sketch can be made directly on the chalk plate, free-hand, or can be transferred to the smooth upper surface of the composition by the use of tracing paper making indented lines on the chalk.

Tracing paper can be placed over a photo or other print for tracing, when the engraving is to be the same size as the original. Use thumb tacks to prevent any movement of the paper or copy, and draw the outlines with a hard pencil; then fasten the tracing over a chalk plate, going over the same lines with a hard pencil or tracing point (a pen-like tool with a straight stylus point), making the indented lines on the surface of the chalk plate.

The picture must not be drawn in reverse, as in preparing linoleum blocks. Trace the lines of your sketch or drawing onto the chalk surface, using the gravers as pens or pencils, and the chalk covered surfaces as you would ordinary white paper.

Copying the Picture, Photo, Drawing, etc.—A simple, inexpensive but efficient copying instrument, called by such trade names as Graph-o-scope, Reflectograph, Sketch-quick, Sketching Spectacles, may be used when transferring a picture to the chalk plate for engraving. Insert the drawing in the spring clip holder of the reflex copying device. Focus light on the drawing. Adjust the optical eyepiece in an upright position opposite picture. By looking into the small round hole on top of eyepiece in a downward direction toward the drawing surface, observe an image of the picture reflected clearly on the surface of the chalk plate. Trace lines of pictures as they appear in the reflected image. Pictures, drawings, etc., may easily be copied by anyone, regardless of drawing experience.

Another method of copying printed newspaper or magazine illustrations direct without employing a camera is by using sensitized photographic paper as the original negative. A sensitized paper is placed in the printing frame, back to the glass. The illustration to be copied is placed face down upon the sensitive surface of the paper. Light, passing through the printing paper, is absorbed by the black portions of the illustration and reflected by the white. (Use paper strips to determine correct exposure.) The resultant paper negative will show copy or printed matter in reverse.

A positive print is then made in the conventional manner, light being passed through paper negative which is placed face to face with the sensitized sheet.

If contrasty paper is used the positive will not only correspond closely with the original copy but will have a soft focus effect created by printing through paper. Glossy, single-weight paper is best for the negative.

Reproducing the Photo as a Line Drawing—A photograph is made up of varying degrees of light and shadow. These lights and shadows can only be duplicated in printed form when using a halftone screen. Since it is impossible to use the halftone screen in making chalk-plate engravings the only other method that can be used is the line drawing method. Shading must be shown by using lines in such a way that varying degrees of shadows can be properly pictured. There are four ways of reproducing a photograph as a line drawing:

1. Make a free-hand drawing from the photograph.

2. Trace over the lines with tracing paper.

3. Make a copy using a pantograph (for perfect reductions or enlargements).

4. Make a silverprint (repro paper).

When the original photo is not of suitable size, make a photographic negative from the original photograph of the size you wish to work on. Place this negative on a glass (or film). Expose the negative to the light, with repro paper (sensitized paper obtainable from any photographic supply house) back of the negative as in making an ordinary print. After exposure to the light one minute, remove the sensitized paper to a basin of plain water. Washing with water develops it. The longer you wash it the more it will develop.

Acetic acid is used to fix the print (one ounce to one ounce of water). Dip the print into the mixture and immediately remove it. When the print is dry it is ready to be worked upon. Simply draw over the photograph using pen and india ink.

Wash in a basin filled with a solution of bicarbonate of soda (baking soda) or chloride of lime for bleaching. Baking soda is a slow but safe medium to use in school. (Other solutions may be used but are not mentioned here because of their poisonous nature.) Use a handful of baking soda to a glass of water. These chemicals bleach out the silverprint leaving only the ink lines that were drawn on the photograph. This ink drawing can now be used as copy in the engraving of the chalk plate. (You may now purchase Photo-Sketch Outfit, Higgins Ink Co., for $1.50, which kit will allow you to reproduce photos in the manner here described).

When the original photo is of suitable size (on smooth dull surfaced bromide or other paper) it can be drawn on and treated in the same way for producing a line drawing.

Engraving the Chalk Plate—The pen and graver to the chalk-plate artist is the same as the brush in the hands of the painter. With your pen or graver you must express qualities, tones, and varied strengths by means of lines, much as the painter expresses values with his brush.

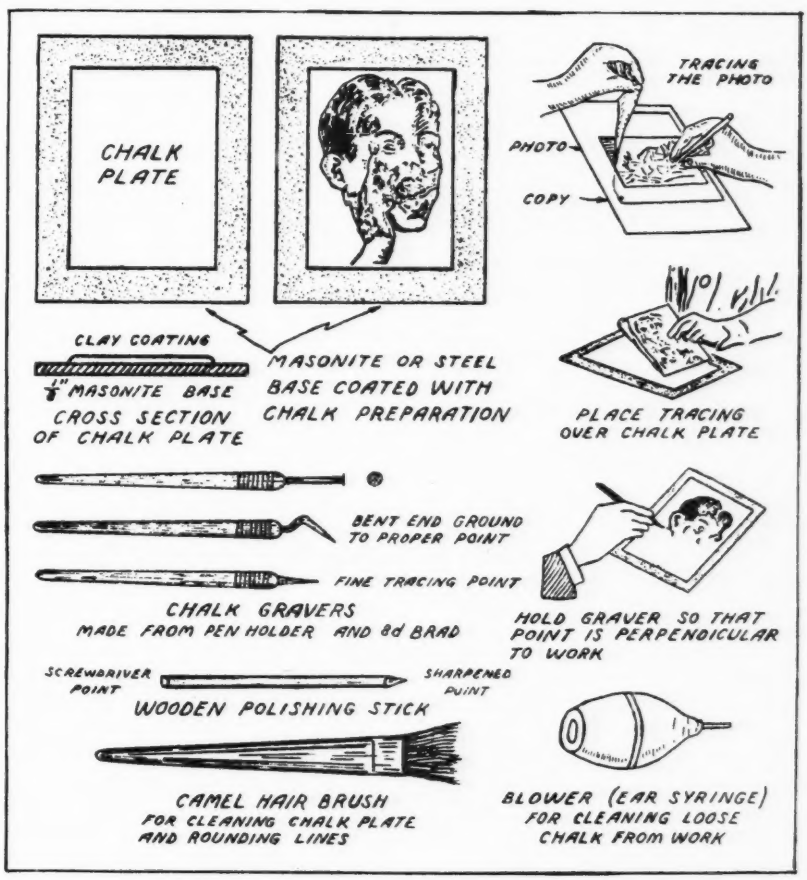
Lines are made in the chalk coating by means of a "graver," a pen-like tool with a curved stylus point. Ordinary penholders can be used to make a set of chalk-plate gravers. Insert a wire nail in penholder. Then bend the nail into a hook-shape and grind and shape the point into different widths and points according to the width of line desired: No. 1, fine, sharp, hair-lines; No. 2, medium fine lines like those made with a pen; No. 3, wider lines, like those made with a soft lead pencil; No. 4, broad lines, for scraping and clearing black spaces; No. 5, for graving and cross-hatching.

Before actual engraving of a chalk plate the beginner should practice making lines. The gravers are handled exactly as you would an ordinary pencil or pen. Parallel lines and cross-hatching should be practiced often with pen, pencil, and gravers No's. 1, 2, and 3, until a knowledge of the possibilities of each line and graver is acquired. All gravers are fine-edged tools, and can be used with either side strokes, or back and forth, up and down, or "shovel-like" movements. Keep the gravers sharp by using a small sharpening stone.

It is advisable to cut the lines into the chalk composition with more than one stroke. On the first stroke, the graver may be allowed to cut (dig) about half-way through the composition, and, on the second or third stroke, penetrate through to the surface of the base plate. Any line, no matter how fine, that penetrates to the base plate will show in the cast and print.

The graver, as it cuts into the plate-coated composition, will cause the chalk to crumble off. This crumbling is necessary, as the artist is actually "digging out" his illustration. The rough appearance of the engraved lines will not interfere in any way with the perfection of the casting. The face of the cast will be that part of the base plate reached (and uncovered) by the chalk gravers. The rough upper part of the chalk plate will be the deep, non-printing back part of the metal or rubber cast.

For scraping off extra large black areas, any flat-ended chisel, or any old "square-edged" pocket knife, can be utilized very efficiently. The composition can be reduced to any thickness desired by scraping it down with a brass rule or a single-edged safety razor blade. Thin down the surface coating approximately one-third of the depth when working to fine detail or lettering. Be sure to reach the surface of the base plate on the first stroke when lettering or doing work in detail. Leave coating full depth where detail is not wanted or used. Use the hook back of graver when the cutting or engraving is com-


CHALK PLATE
TRACING THE PHOTO
PHOTO
COPY
CLAY COATING
MASONITE OR STEEL BASE COATED WITH CHALK PREPARATION
¼" MASONITE BASE
CROSS SECTION OF CHALK PLATE
PLACE TRACING OVER CHALK PLATE
BENT END GROUND TO PROPER POINT
FINE TRACING POINT
CHALK GRAVERS
MADE FROM PEN HOLDER AND 8d BRAD
HOLD GRAVER SO THAT POINT IS PERPENDICULAR TO WORK
SCREWDRIVER POINT
SHARPENED POINT
WOODEN POLISHING STICK
CAMEL HAIR BRUSH
FOR CLEANING CHALK PLATE AND ROUNDING LINES
BLOWER (EAR SYRINGE)
FOR CLEANING LOOSE CHALK FROM WORK

plete; brush out the excess chalk from the lines with a camel's hair brush. Loose chalk may be blown away as the engraving progresses by using a small hand blower (ear syringe). Lightly tapping the back of the plate will help loosen chalk from incised lines. If error is made, chalk can be replaced by making a paste (chalk and water) and patching-in. When patch is dry correction can be made. All work is beveled, rounded off, and brushed before casting is attempted.

Making the Metal Cast.—Satisfactory metal casts can be made from engraved chalk plates in the same manner as that used when making a metal cast from a papier-mache matrix mold. The engraved chalk plate, serving as a matrix or mold, is placed in a stereotype casting box and covered with molten metal poured into the box. The molten metal, which must be considerably hotter than the stereotype metal necessary for casting newspaper mats (600 degrees or hot enough to brown paper), soon fills up every engraved or dug out line on the chalk plate and when cooled, forms a facsimile relief metal printing plate.

Very few schools teach foundry work or have stereotyping equipment. In these cases outside commercial printing establishments or newspaper plants must be asked to help to complete the making of the printing plate from the student-engraved chalk plate.

Cleaning the Chalk Coating from Base Plates.—In cleaning the composition from used chalk plates do so with an old case knife, using a fine sandpaper to remove such particles as can not be removed with the knife. It is important that *all* of the old composition be removed before any new composition can be coated on the steel or masonite base plates. When thoroughly clean, smooth the surface with fine sandpaper. Base plate is then ready for recoating.

Sources of Supply. Ready-to-cut chalk plates may be obtained, together with engraving equipment, etc., from a number of companies, among which are Janes Engraving Plate Co., 1250 Kentucky St., Quincy, Ill., and Hoke Engraving Plate Co., 1024 Park Ave., St. Louis, Mo.

✓ The National Association for Printing Education has selected Harold H. Kirk, formerly the chairman of the National Student Graphic Arts Society, to be director of the STUDENT HONOR DIVISION of this new printing teachers association. The name of the student publication is the *Student Craft News.* Information relative to affiliation with this national student movement in the graphic arts may be had by writing to 4825 Third Street, N.W., Washington, D.C.

Prize-Winning Fruit Bowl Design *by* A. W. LAMP, Jr.

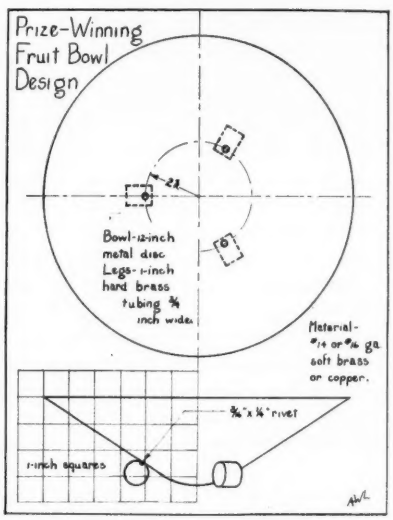
THE simplicity and modern design of this fruit bowl makes it a popular project with students. It received the first-prize award for junior high-school art-metal work at the Ohio State Junior Fair of 1941. The bowl can be made in any shop equipped with the simplest of art-metal tools.

The bowl is formed by raising. One of several methods may be used. A mushroom stake or a hollowed block of wood will prove quite satisfactory. If these are not available, it has been found that the metal can be easily raised by placing the metal disc on the face of an anvil, and tapping with a ball-peen or art-metal hammer from the center out in gradually enlarging circles. As the metal begins to take shape, tip up one side, as this will aid in the raising process. The hammer blow should be struck so that the hammer, metal, and anvil come into contact at the same point, which stretches the metal.

Annealing will be necessary from time to time as the metal becomes hard from hammering. Care must be exercised when annealing brass so that cracks will not result from too rapid cooling of the metal.

The legs are made of one-inch hard brass tubing which may be soldered or riveted to the bowl. Before permanently attaching the legs, all parts should be buffed to produce a highly polished surface.

In order to decrease the cost, the plan may be scaled down as desired, to make a smaller bowl or candy dish. The size of the finished product does not detract from the simple lines which distinguish it. Skill acquired in the manipulation of the tools and the satisfaction derived by the student from the attractiveness and the fine execution of the design make this a very worthwhile project to be incorporated into the junior or senior high-school metal-shop course.



This project is excellent for teaching raising and hammering of metal. A. W. Lamp, Jr., teaches metal shop at Willson Junior High School, Cleveland, Ohio.

Mississippi Valley Conference Elects V. C. Fryklund Chairman

The Manual Arts Conference of the Mississippi Valley held its 32nd annual meeting at the University of Minnesota on October 23-25. This is a group of 65 men engaged in the preparation of industrial arts teachers in universities, colleges, and teachers colleges. Dr. William T. Bawden has been General Chairman from the beginning of the organition. At the meeting just concluded, Dr. Bawden requested that he be permitted to retire from this office. The conference reluctantly honored his request and unanimously selected Dr. Verne C. Fryklund as his successor. The general chairmanship is a continuing office and there are no other officers, the conference being unique in these respects.

American Vocational Association

Industrial Arts Education and Industrial Education Convention Programs
December 10-13, 1941 — Hotel Statler — Boston, Massachusetts

Industrial Arts Education

Industrial Arts in General Education

Thursday December 11 9:00 A.M.

Chairman: Richard M. Savage, Director, Industrial Arts Department, Gorham Normal School, Gorham, Maine, and State Supervisor of Industrial Arts.

Trends—Frank C. Moore, Director of Industrial Arts, Board of Education, Cleveland, Ohio.

Planning the Program—John F. Friese, Associate Professor, Industrial Education, Pennsylvania State College, State College, Pennsylvania.

Preparing the Shops—Willis A. Whitehead, Professor of Industrial Arts Education, State Teachers College, Fitchburg, Massachusetts.

Industrial Arts Below the High School

Friday December 12 9:00 A.M.

Chairman: Augustus F. Rose, Director of Manual Arts, Board of Education, Providence, Rhode Island.

The Elementary Grades—Louis V. Newkirk, Director of Industrial Arts, Board of Education, Chicago, Illinois.

The Junior High School Years—Earl L. Bedell, Director of Vocational Education, Board of Education, Detroit, Michigan; Professor of Vocational Education, Wayne University, Detroit.

Industrial Arts in the High School

Friday December 12 2:00 P.M.

Chairman: Raymond W. Phipps, Chairman, Division of Industrial Arts and Vocational-Industrial Education, Teachers College of Connecticut, New Britain, Connecticut; State Supervisor of Arts and Industries.

Increasing Responsibilities in the Senior Schools—Ralph E. Pickett, Associate Dean, School of Education, New York University, New York City, New York.

Inter-Relationships of Industrial Arts and Vocational Training—Lawrence F. Ashley, Chief, Division of Vocational Education, Board of Education, Yonkers, New York.

Discussion—Led by John J. Metz, Editor, *Industrial Arts and Vocational Education*, Bruce Publishing Company, Milwaukee, Wisconsin.

Priorities in Industrial Arts

Saturday December 13 9:00 A.M.

Chairman: Willis B. Anthony, Director, Industrial Arts Department, State Teachers College, Fitchburg, Massachusetts.

Contributions to Guidance through Industrial Arts—William J. Micheels, Instructor in Industrial Education, University of Minnesota, Minneapolis, Minnesota.

Versatility and Other Youth-Serving Goals in Industrial Arts—Arthur B. Mays, Professor of Industrial Education, University of Illinois.

Industrial Arts Luncheon

Saturday December 13 12:00 noon

Theme: *Industrial Arts and Pre-Vocational Education*

Chairman: Edward C. Emerson, Associate Director of Manual Arts, School Committee, Boston, Massachusetts.

Toastmaster: Norman D. Anderson, Supervising Principal, Vocational Center Schools, Chicago, Illinois.

Early Development of Pre-Vocational Education—Arthur L. Gould, Superintendent of Schools, Boston, Massachusetts.

Preparatory Vocational Education and Training as an Essential Part of the Vocational Education Program—William H. Johnson, Superintendent of Schools, Chicago, Illinois.

Industrial Education

National Association of State Supervisors of Trade and Industrial Education

Wednesday December 10 9:30 A.M.

Chairman: Arthur B. Wrigley, State Supervisor of Trade and Industrial Education, Trenton, New Jersey.

New Developments in the Field of Trade and Industrial Education—Layton S. Hawkins, Chief, Trade and Industrial Education Service, U. S. Office of Education, Washington, D. C.

Discussion Topics:

Methods of Safeguarding and Maintaining a Sound Program of Trade and Industrial Education.

New Fields of Training in an Expanding Trade and Industrial Education Program.

Joint Luncheon of the National Association of State Supervisors of Trade and Industrial Education and the National Association of Industrial Teacher Trainers

Wednesday December 10 12:00 noon

Chairman: Arthur B. Wrigley, State Supervisor of Trade and Industrial Education, Trenton, New Jersey.

A Long-term View of the Program of Trade and Industrial Education and Trade and Industrial Teacher Training—John A. McCarthy, Assistant Commissioner of Education in Charge of Vocational Education, Trenton, New Jersey.

Wednesday December 10 2:30 P.M.

Chairman: Arthur B. Wrigley, State Supervisor of Trade and Industrial Education, Trenton, New Jersey.

Trends in Labor Relations and Their Effect on Programs of Vocational Education—C. E. Rakestraw, Consultant, Employer-Employee Relations, U. S. Office of Education, Washington, D. C.

National Association of Industrial Teacher Trainers

Wednesday December 10 9:30 A.M.

Chairman: Thomas Diamond, Professor of Industrial Education, University of Michigan, Ann Arbor, Michigan; and Consulting Editor, School Shop.

Recent Developments in Industrial Teacher Training—Felix A. Averill, Special Agent, Trade and Industrial Education, U. S. Office of Education, Washington, D.C.

The Nature and Measurement of Mechanical Abilities—S. L. Coover, Director, Department of Industrial Arts, State Teachers College, California, Pennsylvania.

The Development of Instructional Material for Defense Training Classes—W. P. Loomis, Special Representative, Vocational Training for Defense Workers, U. S. Office of Education, Washington, D. C.

An Evaluation of Functional Training Techniques in Industrial Arts—Stanley J. Pawelek, Supervisor of Industrial Education, Baltimore Public Schools.

Report of the Committee on Research, National Association of Industrial Teacher Trainers—Anthony Goldberger, Chairman, Director of Vocational Education, University of Pittsburgh, Pittsburgh, Pennsylvania.

Business Session.

Chairman: F. Theodore Struck, President.

Report of Ed. L. Williams, Secretary-Treasurer, National Association of Industrial Teacher Trainers; Head, Department of Industrial Education, Texas A. and M. College, College Station, Texas.

Wednesday December 10 2:30 P.M.

Theme: *Industrial Teacher Training for National Defense: A Discussion of Problems, Procedures, and Trends*

Chairman: F. Theodore Struck, Head, Department of Industrial Education, The Pennsylvania State College, State College, Pennsylvania.

Open Forum. *Leader:* Homer J. Smith, Professor of Industrial Education, University of Minnesota, Minneapolis, Minnesota.

Speakers:

Lynn A. Emerson, Professor of Industrial Education, Cornell University, Ithaca, New York.

Russell Greenly, Chief, Education and Training, Carnegie-Illinois Steel Corporation, Pittsburgh, Pennsylvania.

Jerry R. Hawke, Regional Agent, Trade and Industrial Education, U. S. Office of Education, Washington, D.C.

A. B. Mays, Professor of Industrial Education, University of Illinois, Urbana, Illinois.

J. G. Spofford, State Department of Education, Trenton, New Jersey.

M. Norcross Stratton, Assistant Director, Vocational Education, State Department of Education, Boston, Masachusetts.

Clyde H. Wilson, Head, Department of Industrial Education, University of Tennessee, Knoxville, Tennessee.

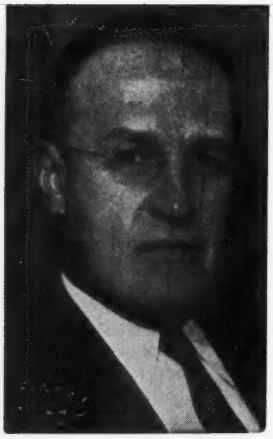
Ed. L. Williams, Head, Department of Industrial Education, Texas A. and M. College, College Station, Texas.

National Association of Trade School Principals

Wednesday December 10 12:30 P.M.

Joint Luncheon of the National Association of Trade School Prin-

L. R. Humpherys, President, AVA. Utah State Agricultural College



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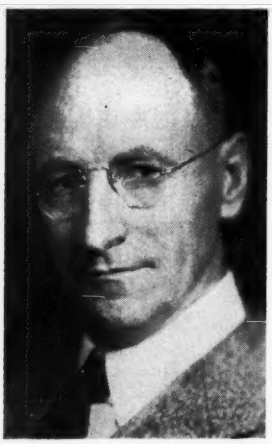
L. H. Dennis, Executive Secretary, AVA, Washington, D.C.



Homer J. Smith, Vice-President, Industrial Arts Education, AVA, University of Minnesota

John J. Seidel, Vice-President, Industrial Education, AVA, Maryland State Director.

CIPALS AND THE NATIONAL COUNCIL OF CITY ADMINISTRATORS OF VOCATIONAL EDUCATION AND INDUSTRIAL ARTS

THEME: *Implications of the National Defense Training Program for the Future of Vocational Education*

Chairman: EDWARD BERMAN, Assistant Superintendent of Schools, Bayonne, New Jersey.

PANEL DISCUSSION:

Chairman: WARREN K. BEGEMAN, Principal, Hadley Technical High School, St. Louis, Missouri.

FRANK P. BRADLEY, Assistant Supervisor for Promotion Defense Training Program, Hartford, Connecticut.

HOWARD A. CAMPION, Assistant Superintendent of Schools, Los Angeles, California.

WALTER B. DENNEN, Director, Boys' Trade School, Worcester, Massachusetts.

LYNN A. EMERSON, Professor of Industrial Education, Cornell University, Ithaca, New York.

ROBERT HOPPOCK, Chairman, Department of Guidance and Personnel Administration, New York University, New York City.

FRANKLIN J. KELLER, Principal, Metropolitan Vocational High School, New York City.

RONALD W. KENT, Assistant Director, Essex County Vocational Schools, Newark, New Jersey.

ESTHER L. MCNELLIS, Master, Trade School for Girls, Boston, Massachusetts.

VIOLETT O'REILLY, Principal, L. E. Rabouin Vocational School, New Orleans, Louisiana.

BLANCHE M. PENN, Assistant Supervisor, Girls' Trades Division of Instruction, Hartford, Connecticut.

CHARLES A. PROSSER, Director, Dunwoodie Institute, Minneapolis, Minnesota.

DANIEL H. SHAY, Supervisor of Industrial Education, Commonwealth of Massachusetts, Boston.

SUMMARY: O. H. DAY, State Director of Vocational Education, Kansas City, Missouri.

BREAKFAST Thursday December 11 7:30 A.M.

Chairman: EDWARD BERMAN, Assistant Superintendent of Schools, Bayonne, New Jersey.

DISCUSSION: Current Problems in the Field of Vocational Education.

NATIONAL COUNCIL OF CITY ADMINISTRATORS OF VOCATIONAL EDUCATION AND INDUSTRIAL ARTS

DINNER Wednesday December 10 6:00 P.M.

Chairman: EDWARD BERMAN, President, Assistant Superintendent of Schools, Bayonne, New Jersey.

DISCUSSION: The Administrative Problems in National Defense Training.

CONFERENCE OF BUSINESS ADMINISTRATION OFFICERS IN NATIONAL DEFENSE TRAINING PROGRAMS

Thursday December 11 9:30 A.M.

Chairman: P. ERNEST WADE, Special Assistant for Business Administration in National Defense Training, Division of Vocational Education, Philadelphia Public Schools, Philadelphia, Pennsylvania.

DISCUSSION: The Business Administrative Problems in National Defense Training.

INDUSTRIAL EDUCATION

Thursday December 11 9:30 A.M.

THEME: *Effective Programs of NYA Related Training*

Chairman: B. H. VAN OOT, State Supervisor of Trade and Industrial Education, State Board of Education, Richmond, Virginia.

SPEAKERS:

BERNARD S. MILLER, State Youth Administrator, New Jersey.

JAMES R. D. EDDY, State Director of Vocational Education, Austin, Texas.

WILLIAM A. WILLIAMS, State Supervisor of Trade and Industrial Education, Charleston, West Virginia.

LEONARD J. MALONEY, Director, State Employment Service, Connecticut.

MARION W. SMITH, State Supervisor of Defense Training, Wisconsin.

M. D. MOBLEY, State Director of Vocational Education, Atlanta, Georgia.

MARTHA G. CREIGHTON, State Supervisor of Home Economics, Richmond, Virginia.

POWELL M. CABOT, Assistant Director, State Employment Service, Massachusetts.

SUMMARY OF DISCUSSION: EDWARD H. LANG, Associate Education Supervisor, State Department of Education, New York.

LONG-TERM PROGRAM AND SOCIAL LEGISLATION

Thursday December 11 9:30 A.M.

THEME: *The Full-Time, Long-Term Program of Vocational Education and the Effects of Social Legislation Upon the Vocational Programs*

Chairman: ALONZO G. GRACE, State Commissioner of Education, Hartford, Connecticut.

SPEAKERS:

FRANCIS T. SPAULDING, Dean, Graduate School of Education, Harvard University, Cambridge, Massachusetts.

H. I. HARRIMAN, Vice-Chairman, American Youth Commission; Former President of the United States Chamber of Commerce.

CHARLES A. PROSSER, Director, Dunwoodie Institute, Minneapolis, Minnesota.

DIVERSIFIED COOPERATIVE TRAINING

Friday December 12 9:30 A.M.

THEME: *Diversified Occupations Program of Industrial Education*

Chairman: ROBERT D. DOLLEY, State Supervisor of Trade and Industrial Education, Tallahassee, Florida.

SPEAKERS:

Evaluating Criteria and Means of Measuring Objectively a Program of Diversified Cooperative Training—E. R. PLOWDEN, State Supervisor, Trade and Industrial Education, Montgomery, Alabama.

The Preparation of and Methods to be Employed in the Handling of Related Study Materials—C. E. RAKESTRAW, Consultant, Employee-Employer Relations, U. S. Office of Education, Washington, D. C.

The Selection and Training of Coordinators of Diversified Cooperative Training—E. F. DANIELS, State Supervisor, Trade and Industrial Education, Jefferson City, Missouri.

A State System of Diversified Cooperative Training Students Clubs—BRUCE V. DAVIS, State Advisor, State Federation of D.C.T. Clubs, Florida.

GENERAL DISCUSSION. Leader: JAMES R. D. EDDY, State Director of Vocational Education, Texas.

LABOR AND INDUSTRIAL RELATIONS

Friday December 12 9:30 A.M.

THEME: *Labor and Industry's Place in the Full-Time Trade Preparatory Program*

Chairman: MRS. BETTY HAWLEY DONNELLY, Secretary, New York Board of Education Advisory Committee, New York.

SPEAKER: KENNETH I. TAYLOR, Secretary-Treasurer, Massachusetts State Federation of Labor, Boston, Massachusetts.

Trade and Industrial Part-Time Programs

Friday December 12 9:30 A.M.

Chairman: Sidney Owen, State Director for Vocational Education, Lincoln, Nebraska.

Speakers:

Part-time Diversified Occupations—James R. D. Eddy, State Supervisor of Trade Industrial Education, Austin, Texas.

Relationship of Part-Time Education to National Defense Training—H. A. Tiemann, State Director of Vocational Education, Denver, Colorado.

Part-Time Apprentice Training—R. L. Welch, Assistant State Director of Vocational Education, Madison, Wisconsin.

Defense Training for the Army and Navy

Friday December 12 2:30 P.M.

Chairman: John Beswick, Chief, Bureau of Trade and Industrial Education, State Department of Education, Sacramento, California.

Speakers:

Colonel Frank J. McSherry, Director of National Defense Training, Federal Security Agency, Washington, D. C.

Commander Frank Cushman, Trade and Industrial Education, U. S. Office of Education, Washington, D.C.

George Saunders, Special Representative, U. S. Office of Education. Detailed to U. S. Army Air Corps, Washington, D. C.

C. A. Bell, State Director of Vocational Education, State Department of Education, Springfield, Illinois.

Apprenticeship

Friday December 12 2:30 P.M.

Chairman: E. K. Jenkins, Supervisor of Apprenticeship, Region No. 1, Boston, Massachusetts.

Apprenticeship in National Defense—Richard R. Brown, Assistant Chief of Apprenticeship, Washington, D. C.

Discussion: *Leader*—Horace A. Riviere, Vice President, Textile Workers Union of America CIO, Manchester, New Hampshire.

Member of the Group:

T. O. Armstrong, Supervisor, Industrial Relations, Westinghouse Electric and Manufacturing Company, Springfield, Massachusetts.

J. C. Beswick, Chief, Bureau of Trade and Industrial Education, State Department of Education, Sacramento, California.

Joseph Biro, Industrial Coordinator, International Correspondence Schools, Scranton, Pennsylvania.

Raymond Chubbuck, Supervisor of Apprentices, Bath Iron Works, Bath, Maine.

C. A. DuBois, Training Supervisor, Scoville Manufacturing Company, Waterbury, Connecticut.

Edward E. Goshen, Principal Apprenticeship Field Representative, 1726 Champa Street, Denver, Colorado.

Roland G. Hartwell, Industrial Training, Harter Educational and Engineering Service, West Boylston, Massachusetts.

Thomas J. Healey, Supervisor of Apprentices, American Airlines, LaGuardia Field, Flushing, Long Island.

Warren E. Hill, Director, Washburn Trade School, Chicago, Illinois.

Chester T. Morey, Apprenticeship Field Representative, Providence, Rhode Island.

J. Arthur Moriarty, Chairman, Massachusetts Commission on Apprenticeship, Boston, Massachusetts.

I. C. Nichols, Apprentice Supervisor, Electric Boat Company, New London, Connecticut.

Reuben T. Peterson, Jr., Associated Industries of Rhode Island, Providence, Rhode Island.

John Pierce, Vocational Director, Springfield High School, Springfield, Vermont.

Harry Smith, Supervisor of Apprentice Training, United Aircraft, Pratt and Whitney Division, Hartford, Connecticut.

Harry Trees, Engineer in Charge, U. S. Signal Corps Laboratory, Fort Monmouth, New Jersey.

Kenneth I. Taylor, Secretary, Massachusetts Federation of Labor, Boston, Massachusetts.

Vocational School Buildings and Equipment

Friday December 12 2:30 P.M.

Chairman: Charles F. Bauder, Director of Vocational Education, Philadelphia.

Buildings and Equipment with Special Reference to National Defense Training—Major S. M. Ransopher, Assistant Director, Equipment and Space, Vocational Training for Defense Workers, U. S. Office of Education.

The Development of the Marine Trades Annex of Mastbaum Vocational School for National Defense Training—Frank R. Robinson, Principal, Jules E. Mastbaum Vocational School, Philadelphia.

Planning and Equipping the L. E. Rabouin Trade School, New Orleans, Louisiana—Violett O'Reilly, *Principal*, L. E. Rabouin Vocational School, New Orleans, Louisiana.

Discussion: What next in the regular program of vocational education as to buildings and equipment?

Airplane Mechanics

Saturday December 13 9:30 A.M.

Chairman: George G. Nelson, Boston Trade School, Boston, Massachusetts.

Speakers

Lieutenant Commander Thomas A. Collins, U.S.N., Supervisor of Recruiting for Naval Air Training, First Naval District, Boston, Massachusetts.

R. G. Kunze, Aircraft Inspector, Civil Aeronautics Administration, Municipal Airport, Boston, Massachusetts.

G. G. McElravy, Senior Aircraft Inspector, Civil Aeronautics Administration, LaGuardia Field, Jackson Heights, New York.

Lieutenant Morten P. Woodason, Engineering Officer, Naval Aviation Base, Squantum, Massachusetts.

Building Construction

Saturday December 13 9:30 A.M.

Chairman: Lester Slocum, New Bedford Trade School, New Bedford, Massachusetts.

Cabinetmaking

Saturday December 13 9:30 A.M.

Chairman: Andrew Rosewall, Boston Trade School, Boston, Massachusetts.

Speakers:

Estey B. Charak, President, Charak Furniture Company, Boston, Masachusetts.

C. D. Shaw, Palmer and Parker Lumber Company, Charleston, Massachusetts.

Electrical Work

Saturday December 13 9:30 A.M.

Chairman: Lloyd E. Taber, New Bedford Trade School, New Bedford, Massachusetts.

Factors Governing the Efficient Instruction of the National Electrical Code in Trade and Industrial Schools—John F. Fitzsimmons, Electrical Instructor, Newton Trade School, Newton, Masachusetts.

Examination of Electricians under Massachusetts Electricians' License Law—Increasing Technical Demands upon Electricians—Representative, Massachusetts State Board of Examiners of Electricians.

What is Expected from Electrical Training Programs in the Field of Trade and Industrial Education—Representative, International Brotherhood of Electrical Workers.

Machine Shop

Saturday December 13 9:30 A.M.

Chairman: John A. Carty, Worcester Boys' Trade School, Worcester, Massachusetts.

Printing

Saturday December 13 9:30 A.M.

Chairman: Richard V. Barry, Boston Trade School, Boston, Masachusetts.

Note: The National Association for Printing Education will meet with the Round Table group and participate in the discussion.

Radio

Saturday December 13 9:30 A.M.

Chairman: Stanley F. Janik, Boston Trade School, Boston, Masachusetts.

Welding

Saturday December 13 9:30 A.M.

Chairman: J. Walter Callahan, Boston Trade School, Boston, Masachusetts.

Annual Banquet

American Vocational Association Annual Banquet. 6:30 P.M. Hotel Statler, Ballroom. $2.75.

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instructional resources

Inquiries concerning materials described in these columns may be addressed to SCHOOL SHOP, Box 100, Ann Arbor, Mich., and will be passed on to the proper firm or person.

Books

General Plastics. Raymond Cherry. Bloomington: McKnight & McKnight, 1941. Pp. 128. $1.20.

A complete text on the use of plastics as a material in shop work. Sections on Related Information, Fundamental Operations, and Projects. Related Information includes chemistry of plastics, types of plastics, and their uses in industry.

The projects involve plastics in a form easily accessible to school shops and workable with common shop tools. Bibliography; index; illustrations.

Raymond Cherry is professor of industrial arts, State Teachers College, Wayne, Nebraska.

Beginning Woodwork Projects and **Advanced Woodwork Projects.** Howard C. Nelson. Peoria: The Manual Arts Press, 1938. Pp. 112 and 101. $.76 each.

A tested group of furniture projects of increasing complexity and scope, each project complete with detailed instructions and drawings. Howard C. Nelson, B.S., is instructor in industrial arts at Monmouth, Ill., High School.

Sheet Metal Workers' Manual. Broemel. Chicago: Frederick J. Drake & Co., 1941. Pp. 542 + index. $2.00.

A complete manual for teachers and workers in sheet metal. Introductory chapters on the sheet metal industry, sheet metal working machinery and tools, and school shop equipment. Chapters on elementary and advanced sheet metal work and pattern drafting, welding, hand forging, brazing, pipe bending, properties of metals and alloys, stainless steel, and practical geometry and mensuration. Material on course outlines especially for emergency defense training. Reference tables; index; photographs and drawings.

Machine Shop Training Course. Franklin D. Jones. New York: The Industrial Press, 1941 (second edition). Vol. 1, 538 pp.; vol. 2, 552 pp. Each volume, $4.00; vols. 1 & 2 together, $6.00.

Covers the entire field of machine shop practice by means of questions and answers. Volume 1 covers lathe work, thread cutting, drilling, boring, measurement, and engineering standards. A new feature of this edition is a section on reading blueprints and mechanical drawings.

Volume 2 includes use of taps and dies, planing, milling, gear cutting, grinding, broaching, chipping, filing, use of tool steels. Both volumes illustrated with photographs and drawings; glossary; indexes. Address Industrial Press, corner Howard and Lafayette Sts., New York, N.Y.

General Printing. Cleeton and Pitkin. Bloomington: McKnight & McKnight, 1941. Pp. 167. $1.60.

The chief value of this book is in its illustrations—most of them actual photographs of exceptional clarity and completeness. Covers all phases of printing: composition, proofing, presswork, etc., with copious amount of related material on machine typesetting, papers, inks, designing, and historical information.

Glen U. Cleeton and Charles W. Pitkin are professor and assistant professor, respectively, in the graphic arts department of Carnegie Institute of Technology.

The Aviation Mechanic. Norcross and Quinn. New York: McGraw-Hill Book Co., Inc., 1941. Pp. ix + 563. $3.00.

Three parts: I, on airplanes, aeronautic theory, and the importance of the mechanic; II, on construction; and III, on maintenance. Covers all phases of fusilage and engine construction, overhaul, and repair. Illustrated; appendix; index. Carl Norcross, Ph.D., is assistant editor of *Aviation*, and member of the Institute of Aeronautical Sciences and of the Aeronautic Educational Commission, New York Board of Education. James D. Quinn, Jr., Lt., U. S. N. R., is in charge of the national defense emergency training program for aviation mechanics.

Machine Shop Theory and Practice. Wagener and Arthur. New York: D. Van Nostrand & Co., 1941. Pp. xiii + 306. $2.28.

Well-illustrated exposition of metal processing technics. Chapters on rules and scales; precision and semi-precision tools; shapers, slotters, and planers; lathes and lathe work; milling machines; dividing-head work; grinders; benchwork; and formulas and tables. Index.

Units in Forging and Welding. Robert E. Smith. Wichita: McCormick-Mathers Publishing Company, 1941. Pp. 56. $.36.

Forging: five information units and 13 operation units, giving information and instruction in the basic operations in forging. Welding: three information units and nine operation units, covering basic facts and operations in oxyacetylene and arc welding. Illustrated. Suggested projects; reference bibliography.

Robert E. Smith is professor of industrial arts and vocational education at Ohio State University, Columbus, Ohio.

Films

Alloy Steels—A Story of Their Development. U. S. Bureau of Mines. 1 reel; 16 or 35 mm.; sound.

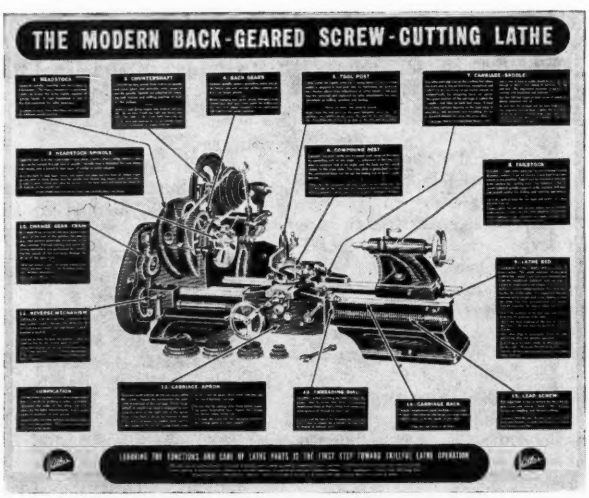
Deals with the development and use of alloy steels and their importance in modern industry.

The Power Within. U. S. Bureau of Mines. 2 reels, 16 or 35 mm., sound.

Depicts construction and operation of the internal combustion engine and of the modern automobile. Address Bureau of Mines. Experiment Station, 4800 Forbes St., Pittsburgh, Pa.

New Wall Chart on Metal-Working Lathe

Atlas Press Co., Kalamazoo, Mich., announces publication of a new chart showing the details of a modern back-geared, screw-cutting lathe. Each part of the lathe is pointed out and described in simple, understandable terms. Price 15 cents, stamps or coin. This is the fourth of a series on lathe operation (see SCHOOL SHOP, Oct., 1941, p. 23).



Addition-Subtraction "Slide Rule"

A new type of "slide rule" that adds, subtracts, and converts fractions of an inch, decimals of an inch, and millimeters has just been placed on the market by the Sum-Up Slide Rule Co., 114 Liberty St., New York, N.Y. Priced at $2.00 this rule performs problems not possible on the regular slide-rule and gives the answer directly and simultaneously in fractions and decimals of an inch and millimeters.

IN THE Morning Mail...

Brief comments about SCHOOL SHOP *and the field it serves are invited. Address the Editor,* SCHOOL SHOP, *Ann Arbor, Michigan.*

Gentlemen:

Since it is desirable that industrial arts content be broadened so we may attain more general objectives, I would like to see SCHOOL SHOP take the initiative by adopting a consistent policy of acquainting industrial arts teachers with specific information of a practical nature on how to get started in the less common fields, such as textiles, ceramics, plastics, etc.

SCHOOL SHOP could do this by setting up a department on "Broadening Industrial Arts Content." It could include, each month, plans for construction of equipment; practical, sound projects; sources of materials, supplies and equipment; a question-and-answer department, etc. Such a department would pull industrial arts out of the "manual training" era, and would be eagerly awaited by thousands of teachers each month.

COURTNEY G. NEWSTEAD
Industrial Arts Dept., Mexico, N. Y.,
Central School, and President, Central
New York Industrial Arts Club

[Drop us a line commenting on or carrying forward Mr. Newstead's suggestion. Address *In the Morning Mail*, SCHOOL SHOP, Box 100, Ann Arbor, Michigan.—*Ed.*]

Gentlemen:

SCHOOL SHOP has a new tang to it that veers from the old standby shop magazines that we have been reading these many years. Its projects are good and their lay-out well described. Its "Instructional Resources" page is a good reminder of sources of information to many shop teachers. I like its "News from Industry" column; and there are some well-expressed thoughts in "What Do You Think?"

Congratulations and thanks for such a grand magazine.

THOMAS M. TETSALL
Director of Industrial Education
Fresno, Calif., Public Schools

Gentlemen:

We salute you for this fine effort. There has long been a need for a paper that would definitely serve the industrial arts field. We believe SCHOOL SHOP will do it.

MARCUS E. ERICKSON
Franklin Junior High School
Brainerd, Minn.

Gentlemen:

You and your staff should be complimented on your fine magazine, SCHOOL SHOP. I approve of it very much, and I am sure that it will be okeyed and welcomed by every shop teacher in the United States.

RAYMOND CHERRY
Professor of Industrial Arts
Nebraska State Teachers College
Wayne, Neb.

Gentlemen:

I had the privilege of examining your new SCHOOL SHOP magazine and wish to congratulate you on publishing a magazine of its quality and for providing a service to the industrial arts teachers of our country.

J. ELY VAN HART, Supervisor
Practical Arts for Boys
Elizabeth, N. J., Public Schools

Gentlemen:

. . . SCHOOL SHOP is well arranged, well printed, and contains many useful articles written by men in the respective fields of industrial arts and vocational education—which makes it valuable as an "exchange of ideas" magazine.

I have just read the column "What Do You Think?" This seemingly controversial subject of grading is a timely one and I enjoyed read- what other instructors in the field have to say about it.

JOSEPH B. COYLE
Instructor in Printing
Johnstown, Pa., High School

["What Do You Think?" is intended to be the first word, not the last, on the subject discussed. What do *you* think? —*Ed.*]

Gentlemen:

Congratulations on the advent of SCHOOL SHOP. It is a milestone in school shop progress. Whoever conceived this idea pressed the button for which thousands of shop teachers have been looking. I hope SCHOOL SHOP will carry on as a dynamic, inspirational periodical for shop teachers.

I thoroughly enjoyed the article by Maris Proffitt. If all shop teachers could only be inspired to meet this challenging program! If school administrators would only see the future for industrial arts as Mr. Proffitt sees it!

Likewise your features, "Washington Letter," "Instructional Resources," and "News from Industry," were most appealing; continue them. Articles of satisfactory projects are always welcome, but keep them on a high level and not too many per issue. I suggest an exchange feature where teachers may present short views and ideas of successful teaching aids.

E. W. ZENISEK
Industrial Arts Dept.
Lincoln High School
Wisconsin Rapids, Wis.

[SCHOOL SHOP will pay for each shop kink or teaching idea printed—more if drawings or photos are included. Send as many as you wish to the Editor, SCHOOL SHOP, Box 100, Ann Arbor, Michigan.—*Ed.*]

Gentlemen:

I enjoyed the October number immensely, but the November issue is even an improvement over the first. I congratulate you upon making available to industrial arts and vocational education teachers another fine professional publication. I am sure your magazine is going over in a big way and will fill a real need since the discontinuance of *Industrial Education Magazine*.

L. T. SMITH
Head, Industrial Arts Dept.
Western Kentucky State Teachers College
Bowling Green, Ky.

Gentlemen:

I have just read, digested, and preserved Vol. I, No. 1 of SCHOOL SHOP. In my opinion, it is one of the best magazines produced in our field including many of the periodicals with long-standing reputations. I wish to congratulate the editor and staff on your excellent job, and wish you continued success for the future.

WILLIAM J. PLOESER
Industrial Arts Dept.
Knickerbocker Junior High School
Lansingburgh, Troy, N. Y.

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The model from the front. Window curtains to be added. The siding effect was cut into the wood on the power saw. Pieces were cut to shape after the "siding" cuts were made on a single large strip of stock.

Models in the Drawing Room

by **Homer C. Rose**

ONE way to increase the interest of the drawing class is to build models of homes designed by students. Models help the student to judge his own house plan more accurately and stimulate him to better planning.

A set of models placed on display in the drawing room is always of interest to both student and visitor.

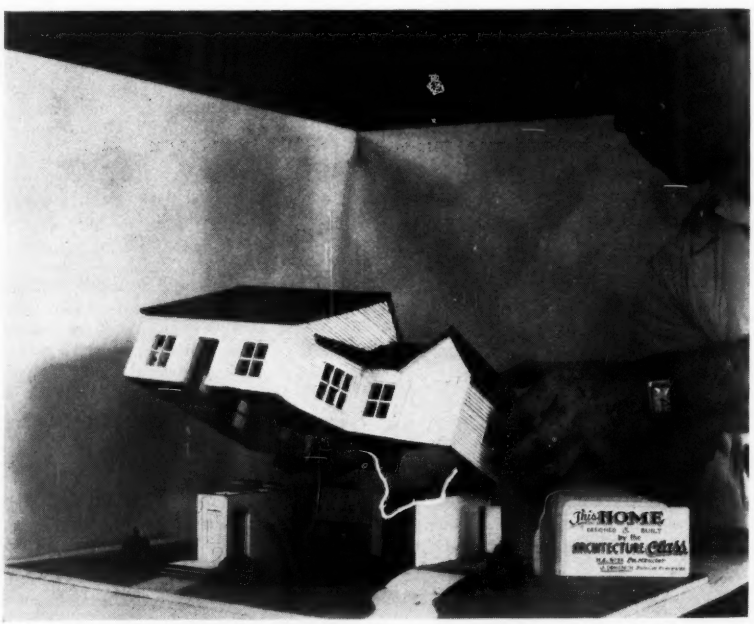
They may also serve as a teaching aid in presenting different styles of homes, in discussing their merits, in uncovering their weaknesses.

A miniature house such as the one shown can be made in a short time. Various members of a class can make parts while others plan the layout. Still other members can do the landscaping, painting, and decorating. Doors and windows can be made on a production basis.

A novel feature of the model shown is that the outside shell of the house can be lifted off, thus showing room arrangement and interior decoration.

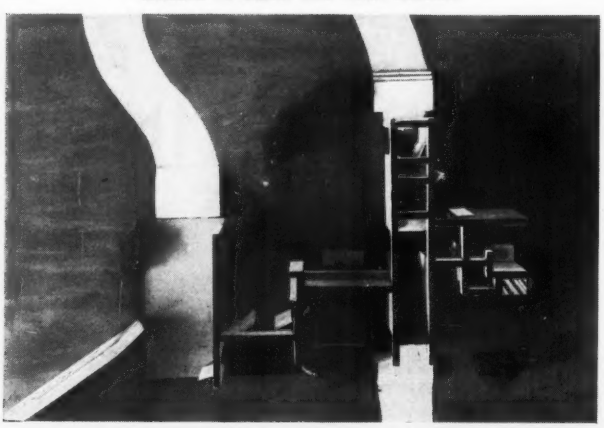
Such a project might well serve as an integration study between home economics, art, and industrial arts departments.

This interest arouser also has value in integrating instruction with the industrial arts, homemaking, and art departments. Homer C. Rose teaches in the Industrial Arts Department of the Southern Illinois Normal University, Carbondale.

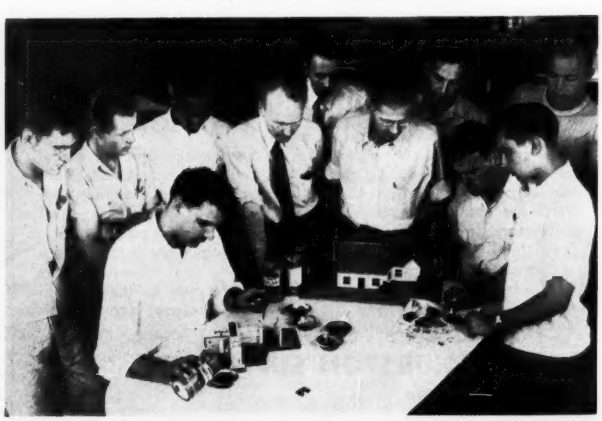


Shell lifted off to get perspective view through the rooms. Note the fireplace, shelves, and stairway. Furniture arrangement can be easily planned.

Looking down on the interior of the model to show room arrangement, location of stairs, and color scheme.



Students study color and interior decoration.



What Do You Think?

Are you using the unit or general-shop type of organization and why?

▸ Says Leonard Daugherty, Supervisor of Industrial Arts, Louisville, Ky., Public Schools:

We are using the unit shop type organization in the Louisville Public Schools. This unit type consists of five shops—simple or elementary mechanics, mechanical drawing, woodwork, general metal, and printing. Our reasons for using this type are as follows:

1. In a city the size of Louisville, where our schools are sufficiently large to require more than one shop teacher, the unit type shop enables us to handle larger groups in each class than a general shop would.

2. A higher degree of teaching efficiency is obtainable in the unit type shop. Teachers who have specialized in one phase of industrial education are more competent, as a rule, to teach that branch than one who has generalized in his program of training.

We have experimented here in Louisville with both and find that the unit shop type of organization is more economical, more efficient, and by far more appealing to the student body.

▸ Says Marshall L. Byrn, Head, Industrial Arts, University High School, and Assistant Professor of Industrial Arts, University of Michigan, Ann Arbor:

The general shop type of organization in industrial arts; why I use it:

1. Because of the extensive and intensive shop experiences possible to offer boys and girls through the general shop type of organization. We have rather complete equipment for teaching artmetal, benchmetal, forging, elementary foundry work, heat treatment of steel, lathe work, shaper (metal), automechanics, elementary and somewhat advanced electricity, and woodwork.

2. Because the general shop offers many opportunities for prevocational experiences not possible in the unit shops—excepting in the larger schools where many types of unit shopwork are both possible and available.

3. Because of the wide range of consumer education possible in the general shop type of organization.

4. Because the general shop type of organization makes it possible to start pupils on work in which they are most interested, thus utilizing keen incentive to achievement when inducting new pupils into the work. I find that boys who were interested in only one phase of shopwork are soon delighted with two or three other types of shop experiences.

5. Because it is possible to complete a much wider range of shop projects, involving varied types of media and tools, without having to go from shop to shop as would be the case in a school having only unit shops.

6. Because of the fact that our school is a medium-sized school. We have neither the pupils nor space available to justify the unit shop system.

Note: I do not believe that the general shop movement will be a panacea for all the ills that inflict the industrial arts program. This type of organization seems to be especially well adapted to industrial arts programs in the smaller high schools, where neither funds, space, nor pupils are ample to justify the unit shop system. I am convinced, however, from visiting many excellent general shops, that an inspirational teacher with exceptional preparation will do a better job of teaching metalwork, woodwork, electricity, etc., in the general shop than a mediocre teacher will do in the finest unit shop.

▸ Says A. F. Rose, Head, Manual Training Department, Central High School, Providence, R. I.:

Sixteen years ago when Providence reorganized its school system and adopted the six-three-three plan involving the building of six

» City Directors «

SCHOOL SHOP has made every effort to check its mailing list for accuracy. Each shop teacher is entitled to a copy of SCHOOL SHOP (see notice on inside front cover). As a further check, it would be appreciated if you would send to the Circulation Department the names and school addresses, along with subject taught, of each of your shop teachers. Your cooperation in this regard will be much appreciated.

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new junior high schools and adapting two grammar schools for junior high-school work, it was decided at the time to adopt the unit shop plan. With this type of shop set-up, we feel that more can be done for the pupils than with the general shop idea. As Providence is an industrial center we were guided in our choice of shops by the type of industries prevailing in the city. Hence we have the following four shops in each of our junior high schools, with one or two exceptions: woodworking, machine shop, art metal, and printing. In one school we have a ceramic shop. Mechanical drawing is also listed as a shop subject as we feel that all students taking shop should also have mechanical drawing. Students in the 7B, 7A and 8B grades are required to take one term in woodworking, art metal, printing, and mechanical drawing. After 8B, students are permitted to elect the shop they prefer.

With this plan we can follow a more unified course of study and cover more ground thoroughly as each teacher is trained especially for his subject. All shops in the senior high schools are elective and the following are offered: woodworking, machine shop, art metal, textiles, electricity, ceramics, and mechanical drawing.

In three of our elementary schools we have shops that are more general in nature where work in wood and metal is carried on.

▸ Says Earl L. Bedell, Director of Vocational Education, Public Schools, Detroit, Michigan:

The phrase "General Shop" refers to a type of organization in which two or more activities are carried on simultaneously. The organization of the industrial arts on a general shop basis seems to imply by common understanding the use of a variety of materials and tools which results in a corresponding variety of projects. The "Laboratory of Industries" is also a name which has been given some recognition for industrial arts organization that involves a variety of activities.

There is, however, another concept of the general shop work which permits it to apply in the case of general woodworking, general metalworking, general electrical work, and general drafting. These designations refer to a shop organization which permits pupils to rotate through a large number of activities but all within one field or area of industrial arts. In other words, it is not necessary to have entirely unrelated activities in order to qualify as a general shop.

The "Unit Shop" signifies an organization for training within the areas of one activity or with a single material. To attempt a clear-cut differentiation between a general shop and a unit shop is almost as difficult as to tell exactly the difference between a hill and a mountain. A unit shop can be so organized that it becomes a very highly specialized unit of instruction within any area of training. Examples of the unit shop are the courses organized in the vocational education program for national defense, in which trainees are instructed for a specific payroll job.

▸ Says Carl T. Cotter, Director of Vocational and Industrial Education, Board of Education, Toledo, Ohio:

In the Toledo industrial arts program grades 7 and 8, elementary schools, the general shop is used. Instruction covers sheet metal, 7 weeks; electricity, 7 weeks; woodshop, 14 weeks; drafting and sketching, 8 weeks. Periods, three 45-minute periods per week. This program with its variety of youth experiences fits well into the avocational and home activities of youth at this level and it has functioned in a preparatory and guidance way for further training on the high-school level.

The shops in the five senior high schools are operated for the most part on the unit plan. However, two of the newest senior high schools have one general shop. These general shops function with the enrolment that did not come up through the public elementary schools. There are from seven to nine unit shops in each building. Ninth-grade students are on a rotating program for one year. This is a preparatory requirement for entrance into the vocational high school. At the end of the ninth grade they can elect to go to the vocational high school or to remain on an industrial arts basis (one 90-minute period daily) in a shop activity of their own choice.

This plan has worked very satisfactorily over a period of years and as a result we have been getting a much higher type of student in our vocational set up.

▸ Says L. P. Elliott, Supervisor of Industrial Education, Public Schools, Peoria, Illinois:

While the term "general shop" is relatively new, the idea behind it dates back a good way. We have had some isolated shops that were doing more than one type of work long before the term "general shop" was coined. Where the teaching force is limited and the room for industrial work limited, it is rather advisable to attempt to do a number of types of industrial work in the one shop with one teacher. On the other hand where there are a number of shops and a number of teachers, double general shops are not satisfactory and do not meet the needs of the school. The combination of large-sized classes taught under high pressure with a young teacher who probably knows only one line of work makes it very desirable to specialize in each shop and rotate the classes from shop to shop.

▸ Says J. R. Mulholland, Director, Department of Industrial Arts Education, Kanawha County Schools, Charleston, West Virginia:

We are using both types of organization in our school system. West Virginia is one of those states having the county-unit plan of education where consolidation is emphasized.

About two years ago, Kanawha County, of which Charleston is the center, embarked upon a four-million-dollar building expansion program which afforded an extensive shop program. We believe that in such larger city schools and consolidated schools where the enrolment and staff of teachers permits, that the unit plan of organization is the most desirable, however, on a better integrated basis of unit shops than was in operation a few years ago. For smaller schools and in interurban communities where the enrolment and staff of teachers does not permit of the unit shop organization, we have equipped shops and we believe that the general shop type of organization should be in operation, thus giving the smaller schools and smaller communities a background of general education in at least some of the major brackets of our larger and important industries. We hope to give our students some knowledge of the materials and processes used in these industries, in the general shop type of organization as well as in the unit type plan.

With this in view, we have organized, within the past year, quite an elaborate course of study.

▸ Says R. A. Hinderman, Director of Research and Vocational Education, Denver, Colorado, Public Schools:

The Denver public schools are interesting because of the variations in them. Some of the schools are extremely large and others are very small. As in most cities the economic status of the pupils in some schools is quite different from that of pupils in others. As a result general shops have been provided in schools where the enrolment is small. The purpose of the general shop is to provide a well-rounded industrial arts program for all of the pupils.

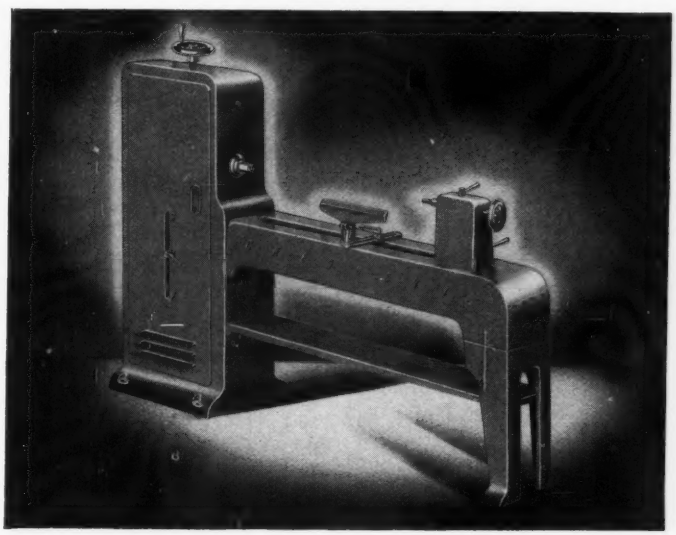
In the larger schools where unit shops are possible, they have been organized to provide the same broad range of industrial arts facilities as are found in the general shop. The only differences are the more highly specialized teachers and the larger amounts of equipment available for metal work, woodwork, ceramics, drafting, general crafts, auto mechanics, and so on.

The general education program in the Denver public schools has made the industrial arts laboratory a vital educational device. It has been found that the resourceful general shop teacher and the proficient unit shop teacher are equally adept in providing educational experiences needed to functionalize many phases of general education.

Personalities . . .

ALVIN H. EILERT has been promoted to the principalship of Schneider Vocational High School, Stockton, Calif. . . . PHILIP J. HEFFERNAN is now principal of the Somerville, Mass., Vocational School, replacing HARRY L. JONES, who has retired. . . . JAMES STEWART GIBSON, retired administrative principal of Newark, N. J., Textile High School, died recently after a long illness. . . . MERLE HENRY, formerly industrial arts instructor at Alpena, Mich., has taken a position in the industrial arts department of Flint, Mich., public schools. . . . HUGH CAPRON has taken over the work of STANLEY PAWLEK of the industrial arts department at Winona State Teachers College, Winona, Minn. STANLEY PAWLEK, on leave of absence last year from the college, has accepted the directorship of the Baltimore schools. . . . GEORGE MORRIS, former Saginaw, Mich., garage owner, is now instructor in automechanics at Arthur Hill Trade School, Saginaw. . . . OAKLEY FURNEY, chief of the bureau of industrial and technical education of New York State Education Department, has been made director of vocational education for defense workers. . . . DAVID BURCHAM is retiring as principal of Long Beach, Calif., Polytechnic High School. He has been at this post since 1907. . . . J. J. MATTHEWS, formerly of Pennsylvania State College, is now in charge of vocational education in Gary, Ind., schools. . . . GEORGE F.

PIGOTT, JR., has become assistant superintendent of the New York City schools. He was formerly principal of Brooklyn High School for Automotive Trades and administrator of the defense-training program in the city schools. . . . N. C. PARKS, former principal and director of vocational education in Edgefield, S. C., High School, is now assistant superintendent for vocational rehabilitation with the South Carolina State Department of Education. . . . JAMES OTIS LOFTIN has resigned as president of Texas College of Arts and Industries, Kingsville. . . . FRED C. WHITCOMB, director of the division of practical arts and professor of industrial education, Miami University School of Education, Oxford, Ohio, is retiring from active service. . . . NELSON HAUER, of the School of Vocational Education, Louisiana State University, is now on the staff of the Louisiana State Department of Education. . . . GARTH H. AKRIDGE is now director of vocational education, ranking as assistant superintendent of schools, for the Miami, Fla., area. He was formerly southern regional NYA director and southern field agent for the Julius Rosenwald Fund. . . . FREDERIC ERNST, associate superintendent of schools, New York City, has been made head of the division of vocational schools. He will continue as director of the high-school division. . . . ROBERT H. WISNER, formerly vocational education director at Michigan Reformatory, Ionia, and connected with occupational and guidance under the National Defense Program, is now field agent in Rehabilitation District No. 1, Lansing, Mich. . . . JOHN R. HILL, teacher of related subjects and coordinator of apprentice training in the St. Claire Shores, Mich., area, died in July of this year. . . . JOHN J. HARRIS, of the Michigan State Board of Control for Vocational Education, is now supervisor of vocational training of defense workers. . . . ANDREW TRICHE, of the University of Pittsburgh, has been appointed supervisor of trade and industrial education for the State of Louisiana. . . . DONALD E. PHIPPIN, has been appointed assistant professor of industrial-arts education, Teachers College of Connecticut. . . . PAUL B. HARTMAN, formerly with the U. S. Office of Education, has been appointed director of national defense training for Ohio. . . . DR. GEORGE E. MYERS, professor of vocational education and guidance at the University of Michigan at Ann Arbor, will retire in February, after many years of service to his field. His duties will be taken over by Professor THOMAS DIAMOND, professor of vocational education at the University. . . . Dr. FRANK DALTON, now chief of the trade and industrial education division of the Michigan State Board of Control for Vocational Education, has been transferred to the teacher-training division and assigned to the University of Michigan, where he will be lecturer in education. . . . JOHN SUCHOVSKY, formerly printing instructor at Hackley Manual Training School, Muskegon, Mich., has taken a position as director of the Lake Farm Incorporated, private boys' school near Kalamazoo, Mich. . . . REINHARDT KRAUSE, formerly of Boyne City, Mich., schools, is now teaching drafting and shopwork at Bay City, Mich., Central High School. . . . The following teachers have taken new positions in the Pennsylvania schools: MERRILL H. ALEXANDER, carpentry, Tyrone; EDGAR BENNER, industrial arts, Biglerville; RALPH C. DILLER, industrial arts, Harding Junior High School, Lebanon; DAVID FITHIAN, industrial arts, Grove City; THOMAS HOLSTON, electricity, Lebanon; CHARLES MEANS, industrial arts, Lansdowne, and EDWIN SUMMERS, industrial arts, West Pittston.



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"Crescent V-14" is a new lathe just introduced by Crescent Machine Co., Leetonia. Ohio, It is a production lathe with extra power for rough turning, yet accurate for fine detailed work.

A stepless, seven-to-one range of speed is obtainable by means of a variable speed device that can be varied while the lathe is in motion. Streamlined in appearance, the lathe has all moving parts enclosed but easily accessible.

The V-14 is offered in several sizes, with bed lengths of 42, 48, 60, and 72 inches.

● A "materials laboratory" where artists studying industrial design can develop a realistic concept of the workability of wood, glass, metals, plastics, and other substances in commercial use has been established at Cooper Union in the industrial design department. By applying the laboratory techniques practice in the Cooper Union Engineering Schools to the aesthetic training received in the art schools, students are learning to incorporate beauty and usability in the same objects. Using power drills, metal molds, lathes, circular saws, and presses, they make extensive experiments to determine the strength, flexibility, ductibility, and other characteristics of various substances. Problems of current commercial needs are given students as soon as they have had laboratory experience. At the present time these include a fluorscent floor lamp for general home use, a redesigned soft-drink bottle and delivery container to eliminate wasted space, and an army cot.—*Journal of Higher Education.*

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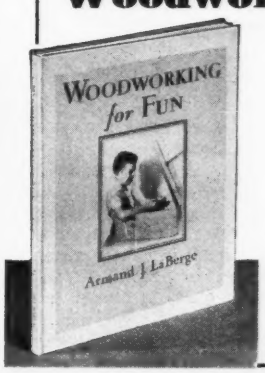

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The Manual Arts Press
PEORIA, ILLINOIS

Washington Letter

by **Alan Murray**

SALOONS and "juke joints" may soon be considered benefactors of public education, particularly in industrial arts and vocational courses. Their service lies in pioneering in the use of the popular new nickel-in-the-slot devices which present sound movies.

One manufacturer has maintained a staff of demonstrators for over a month this fall in the Nation's Capital, giving private exhibitions of the machine to government and education officials. Enthusiasm has been aroused over the idea of adapting the glorified "juke boxes" to school use. The present device is an automatically operating box containing a projector and a screen. Upon insertion of a coin, one of a series of three-minute movies is shown. For schools, the slot mechanism would be discarded and longer features presented. An increasing number of motion pictures valuable to students in school shops is available.

The advantages of the device over ordinary projectors are that it needs no operator (reels can be changed by anyone in about two minutes), shows pictures clearly in daylight or artificial light, operates in small rooms, and reaches audiences of from one to 250 people.

● Perhaps the most important single educational development in 1941 is the entirely unexpected drop in secondary school enrolments. The U. S. Office of Education is verifying by questionnaires to school systems, newspaper reports from every part of the nation that high-school figures are either stationary or are reduced up to 10 percent, with practically no increases registered in any community.

No estimates are available regarding the proportion of academic, industrial arts, and vocational courses which have been affected. But combined with the shortage of teachers, a reduction in enrolment in industrial arts might affect this field profoundly.

● Fiery Maurey Maverick, formerly a Texas Congressman and later mayor of San Antonio, is now in charge of approving priority ratings for school equipment, supplies, and material under a new procedure just adopted. Signed and notarized applications are now sent directly to the Director of Vocational Training for Defense Workers, U. S. Office of Education, whose office checks them and makes recommendations. They then go to the Office of State and Local Government Requirements Branch, Division of Civilian Supply, OPM, of which Maverick was recently made chief, where they are approved.

The general policy covering preference ratings is that nondefense requests must be for uses essential to "the health, welfare, and safety of the civilian population." *Each case is decided on its individual merits, however, rather than in accord with fixed regulations.*

● The approximately four million workers in defense industries of today will probably increase to six million by the middle of 1942, and will double during the following fiscal year, according to Washington estimates. A vast majority of the twelve million will probably be individuals transferred from nondefense industries and not those at present unemployed. Contradictory as an all-out defense effort which includes several million employable but idle people may sound, there are those who believe that total employment will not rise appreciably in the near future. Latest available estimates of unemployment, made by the WPA, indicate that the ranks of the jobless increased by approximately 700,000 between August and September, 1940.

Defense budgets now being planned are expected to provide tremendous expansion of the defense-training program.

● A consolidation of the NYA and CCC now seems assured, with a plan being worked out by Federal Security Administrator McNutt at the request of President Roosevelt. How this will affect present programs is not yet known. Intense efforts are being made by various financial and tax-lowering groups to abolish both agencies and all other federal nondefense youth-serving activities. Fears are expressed privately that some educators and school officials have unwittingly given aid to reducing federal aid for education by allowing their zeal for maintaining local and state control of education to lead them into vigorous attacks on such agencies as NYA. Using such attacks as a basis, financial interests are strengthened in their continuous campaign to reduce all educational expenditures.

NEWS

WEST VIRGINIA INSTITUTE OF TECHNOLOGY is the new name given by the state legislature to New River State College, Montgomery, W. Va. The college now operates under a specific law, rather than under complete control of the State Board of Education, as formerly.

A VOCATIONAL department has been added to the Sunbury, Pa., high school. ROBERT KNOEBEL has been appointed director; ARTHUR PRICE, drafting instructor; and HARRY D. WEAVER, machine-shop instructor.

NEW RICHMOND, OHIO, high school is expanding its vocational training program this year, with an arrangement whereby senior students work five hours per week in industry on a cooperative basis.

SPRING of this year saw the opening of a new vocational building at Hardin Junior College, Texas.

DEFENSE-TRAINING classes have been granted an aluminum quota of a million pounds of sheet aluminum and 240,000 rivets each three months. Defense classes seeking aluminum must advise the State Vocational Education Director, who sends requests through U. S. Office of Education to OPM for priorities approval.

STAFFORD, Kans., has a new $23,000 school building housing vocational and industrial activities of the school.

ROBERT W. HAMBROOK, senior trade and industrial specialist for the U. S. Office of Education, has recently returned from a four-month study of education in wartime England. Among his studies were the problems of training men and women for war industries, education for military forces, and emergency training of radio men and RAF ground workers.

MARIS M. PROFFITT, industrial arts consultant in U. S. Office of Education, is liaison officer with the Treasury Department in carrying out bond drive campaigns in schools this year.

Index to Advertisers

Brandon Films, Inc. 17
Education Digest ..... Inside Rear Cover
Manual Arts Press 23
McKnight and McKnight 19
Ohmite Manufacturing Co. 21
South Bend Lathe Works ..... Outside Rear Cover
Sum-Up Slide Rule Co. 17
Thurston Supply Co. 19
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